

UNIVERSITY
OF MICHIGAN

DEC 11 1953

BUSINESS ADMINISTRATION
LIBRARY

The American STATISTICIAN

The news publication of the
AMERICAN STATISTICAL ASSOCIATION

DECEMBER, 1953

Volume 7, No. 5

| | |
|---|----|
| NEWS | 2 |
| FEDERAL STATISTICAL ACTIVITIES | 3 |
| STATISTICS AND SOCIAL FORCES | |
| By Stuart A. Rice | 7 |
| THE REVIEW AND COORDINATION OF DATA COLLECTING | |
| AGENCIES SPONSORED BY THE FEDERAL GOVERNMENT | |
| By Harry Alpert | 12 |
| EXTENT AND CHARACTER OF ERRORS IN THE | |
| 1950 CENSUS | |
| By A. Ross Eckler | 15 |
| REPORT OF ASA ADVISORY COMMITTEE ON STATISTICAL | |
| POLICY TO THE BUREAU OF THE BUDGET | 20 |
| PROGRAM OF THE INSTITUTE OF MATHEMATICAL | |
| STATISTICS, Washington, Dec. 27-30 | 22 |
| NEWS ABOUT MEMBERS | 25 |
| CHAPTER NOTES | 29 |

35 CENTS

ASA PROGRAM COMMITTEE, ANNUAL MEETING 1953

| | | |
|-----------------|--|--|
| HERBERT SOLOMON | <i>Teachers College, Columbia University</i> | Chairman |
| A. H. BOWKER | <i>Stanford University</i> | |
| J. CAMERON | <i>National Bureau of Standards</i> | Committee on Statistics in Physical Sciences |
| W. E. DEMING | <i>New York University</i> | |
| ARTHUR DUTTON | <i>University of Rochester</i> | Biometrics Section |
| J. FREUND | <i>Alfred University</i> | Section on Training in Statistics |
| H. W. GREEN | <i>Cleveland Health Council</i> | |
| M. J. HAGOOD | <i>B. A. E., U. S. D. A.</i> | Social Statistics Section |
| M. HANTAY | <i>National Bureau of Economic Research</i> | |
| C. F. KOSSACK | <i>Purdue University</i> | |
| G. J. LIEBERMAN | <i>Stanford University</i> | |
| CLARENCE LONG | <i>Johns Hopkins University</i> | Business and Economics Section |
| DON RILEY | <i>Bureau of the Budget</i> | 1953 Local Arrangements Committee |
| A. WALLIS | <i>University of Chicago</i> | |
| A. N. WATSON | <i>Wesleyan University Press</i> | |
| SAMUEL WEISS | <i>Bureau of Labor Statistics</i> | |
| M. WOODBURY | <i>University of Pennsylvania</i> | |

EX OFFICIO

| | |
|------------------|--------------------------------------|
| W. S. COCHRAN | <i>Johns Hopkins University</i> |
| MORRIS H. HANSEN | <i>Census Bureau</i> |
| W. E. HOADLEY | <i>Armstrong Cork Co.</i> |
| H. MARSHALL | <i>Dominion Bureau of Statistics</i> |
| R. LIKERT | <i>University of Michigan</i> |
| A. J. WICKENS | <i>Bureau of Labor Statistics</i> |

CONTRIBUTED PAPERS SESSIONS FOR 1954 ANNUAL MEETING

The American Statistical Association is sponsoring two sessions of contributed papers at its 1954 Annual Meeting to be held in Montreal, Canada on September 10th through 13th. The papers will be of fifteen minutes length. Titles of the papers together with names and addresses of authors should be mailed to Prof. Boyd Harshbarger, Head, Department of Statistics, Virginia Polytechnic Institute, Blacksburg, Va. Prof. Harshbarger will be coordinator of the sessions.

The American STATISTICIAN

DECEMBER, 1953, VOL. VII, NO. 5

The news publication of the
American Statistical Association

Founded 1839

EDITORIAL COMMITTEE

Almarin Phillips, chairman; Guenther Baumgart, David B. Duncan, Churchill Eisenhart, Morris Hamburg, Walter Hoadley, Jr., J. E. Morton, Harry V. Roberts.

Department Editors:

News and Notes
Dana Barbour

Questions and Answers
W. S. Connor
I. R. Savage

Correspondents: Albany—Vera Kilduff; Austin—Stella Traweck; Central New Jersey—William B. Schrader; Chicago—Robert E. Bruce; Cleveland—M. F. Vincent; Columbus—John R. Ervin; Connecticut—Roger Stark; Cuba—Hugo Vivo; Los Angeles—Donald A. Smith; New Orleans—Richard W. Graves; New York—Douglas Greenwald; North Carolina—Lloyd Saville; Oklahoma City—Everett P. Truex; Philadelphia—Mary McDermott; University of Illinois—Robert Ferber; Washington—Margaret Martin; Government—Virginia Venneman; Latin America—Francisco de Abrisqueta; United Nations—F. Marguerite Nowak.

OFFICERS OF THE ASSOCIATION

President: William G. Cochran; *President-Elect:* Herbert Marshall; *Past President:* Arnyess Joy Wickens; *Secretary-Treasurer:* Samuel Weiss; *Vice Presidents:* Morris H. Hansen, Walter E. Hoadley, Jr., Rensis Likert; *Directors:* W. J. Dixon, Margaret J. Hagood, Howard L. Jones, William R. Leonard, John W. Tukey, Ralph J. Watkins; *Members of the Council:* Irwin Bross, Lucille Derrick, A. Ross Eckler, Martin R. Gainsbrugh, Ezra Glaser, Werner Hochwald, A. J. Jaffe, Mildred M. Lauder, Howard Levene, Kenneth E. Miller, Almarin Phillips, Orville B. Railey, J. A. Rigney, Harry S. Schwartz, John R. Stockton, Rufus S. Tucker, David F. Votaw, Jr., F. M. Wadley, W. Allen Wallis, W. J. Youden.

The Editorial Committee welcomes the submission of manuscripts for possible publication. Two copies, double-spaced, should be sent to the Editor, Almarin Phillips, E-140 Dietrich Hall, University of Pennsylvania, Philadelphia 4.

News and notes should be sent to Dana Barbour, News Editor, American Statistical Association, 1108 16th Street, N.W., Washington 6, D. C.

Entered as second class matter March 11, 1938, at the post office at Washington, D. C., under act of March 3, 1897. The American Statistician is published five times a year—February, April, June, October and December—by the American Statistical Association, Editorial Office: 1108 16th Street, N.W., Washington 6, D. C. Subscription rate: one dollar and fifty cents a year or thirty-five cents per copy.

Anyone wishing to change their mailing address should allow eight weeks' notice. A copy of the address taken from an issue of the periodical should accompany the change-of-address request.

PRE-REGISTRATION FOR ANNUAL MEETING IN WASHINGTON

All members have received in the mid-November mailing a pre-registration card and a hotel room reservation card for the ASA annual convention, December 27-30. The Local Arrangements Committee urges all who have not done so to send in their registration card. Members are also reminded that hotel reservations are sometimes difficult to obtain in Washington and are advised to make arrangements in advance.

Mark Your Calendar Now for

American Statistical Association's Annual Convention

DECEMBER 1953

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY |
|--------|--------|---------|-----------|----------|--------|----------|
| | | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 31 | | |

Shoreham Hotel — Washington, D. C.

International Statistical Institute Session

The 28th session of the International Statistical Institute was held in Rome, September 6-12, 1953. In addition to delegates and other participants from 34 countries, the United Nations and several of the specialized agencies, the American Statistical Association and other national statistical societies, and other learned societies were represented. The American delegation was headed by Stuart A. Rice, Assistant Director for Statistical Standards, Bureau of the Budget. Other participants from the United States included: Charles A. Bicking, Office of the Chief of Ordnance; C. I. Bliss, Yale University; Grant I. Butterbaugh, University of Washington; W. G. Cochran, Johns Hopkins University; Morris A. Copeland, Cornell University; Gertrude Cox, University of North Carolina; Joseph F. Cunningham, Department of the Air Force; Besse B. Day, USN Engineering Experiment Station; Calvert L. Dedrick, Bureau of the Census; Louis I. Dublin, Metropolitan Life Insurance Co.; John Durand, UN Population Division; Grover W. Ensley, Joint Committee on the Economic Report, U. S. Congress; W. Duane Evans, Bureau of Labor Statistics; Frank Garfield, Federal Reserve System; Milton Gilbert, Organization for European Economic Cooperation; Margaret Gurney, Bureau of the Census; Robert C. Hamer, Bureau of the Census; Harold Hotelling, University of North Carolina; Simon Kuznets, University of Pennsylvania; William R. Leonard, UN Statistical Office; Frank Lorimer, American University; Oskar Morgenstern, Princeton University; William R. Pabst, Jr., Bureau of Ordnance; Karl Pribram; Charles F. Roos, Econometric Institute, Inc.; Hans Staehle, General Agreement on Tariffs and Trade; Samuel Weiss, Bureau of Labor Statistics; P. K. Whelpton, Scripps Foundation; and Robert M. Woodbury, International Labor Office.

A total of some 180 scientific papers were presented in the fields of industrial productivity and standardization, economic statistics, agricultural statistics, population statistics, social and cultural statistics, general methodology and mathematical statistics, training in statistics, and regional cooperation in statistics. These papers will be reproduced in the Conference Proceedings.

The following officers were elected to serve until the next Institute session two years hence: Professor George Darmois, of the University of Paris, President; Dr. Ph. J. Idenburg, Director General of Statistics of the Netherlands, Secretary General; Professor R. G. D. Allen, London School of Economics, Treasurer; and Professor M. Boldrini, Milan, Dr. M. A. Teixeira de Freitas, Rio de Janeiro, Dr. R. C. Geary, Dublin, and Dr. Herbert Marshall, Dominion Statistician of Canada, Vice Presidents. Dr. Stuart A. Rice, retiring after three two-year terms as the Institute's President, was elected an Honorary President.

The next session of the Institute will be held in Rio de Janeiro in 1955.

Cooperative Graduate Summer Sessions in Statistics

Beginning in 1954 North Carolina State College, the University of Florida, Virginia Polytechnic Institute and the Southern Regional Education Board will jointly sponsor cooperative graduate Summer Sessions in Statistics.

Each of the summer sessions will last six weeks and each course will carry three semester hours of graduate credit, with a maximum of six semester hour credits earned in one summer. The courses are arranged to enable the person to take consecutive work in successive summers. The work in statistics may be applied at any one of the cooperating institutions in partial fulfillment of the requirements for a Master's degree. The catalog requirements for the degree must be met at the degree-granting institutions. Each Doctoral candidate should consult with the institution from which he desires to obtain the degree regarding the applicability of the summer courses in statistics.

During the first session Professor Maurice Kendall of the University of London will give a course in Multivariate Analysis, and Dr. Ralph Comstock of North Carolina State College will give one in Quantitative Genetics.

The staff of the Virginia Polytechnic Institute's Department of Statistics will offer such courses as Probability and Inference, Analysis of Variance, Statistical Methods, Engineering Statistics, Education Statistics, Rank Order Statistics and the Theory of Sequential Methods.

The department includes R. A. Bradley, D. B. Duncan, M. C. K. Tweedie, P. M. Somerville and Boyd Harshbarger. In addition, other outstanding statistical scholars will direct special afternoon seminars. The agricultural, science and engineering divisions of the College will make available advanced courses for students who wish to supplement their work in statistics.

The fee for the Virginia Polytechnic Institute session is \$30.00. Board, room, post office box and laundry for the entire session may be had for \$76.40. The session will run from June 9 through July 17, 1954.

Inquiries should be addressed to Boyd Harshbarger, Head, Department of Statistics, Virginia Polytechnic Institute, Blacksburg, Virginia.

Annual Conference of ESOMAR

The next Annual Conference of ESOMAR (European Society for Opinion Surveys and Market Research) will be held in Belgium from September 6th to September 10th, 1954. Some of the sessions will be entirely devoted to Round Table Meetings, at others, papers will be read. Anyone desirous of submitting a paper should write to Henry Durant, President, ESOMAR, 59 Brook Street, London, W.1. American visitors to the Conference are most cordially welcomed.

New Population Council Fellowships

The Population Council, Inc. announces a fellowship program to assist in the advanced training in the study of population of students in the social and natural sciences at the predoctoral or postdoctoral levels. The Council plans to grant six fellowships during the academic year 1954-55, to be divided between students from the United States and from other countries. The basic stipend is \$2,500, but this may be supplemented under certain circumstances, particularly in the case of postdoctoral fellowships. Preference will be given to candidates who are not over 40 years of age. Application for fellowships for the academic year 1954-55 should be submitted before February 1, 1954. Requests for application forms or for further information should be addressed to Mr. Frederick Osborn, Executive Vice President of the Council, 230 Park Avenue, New York 17, N. Y.

The Population Council has recently been established as a non-profit corporation in order to encourage research and education concerning the relationship of the world's population to its material and cultural resources. The trustees are Frank G. Boudreau, Detlev W. Bronk, Karl T. Compton, Frank W. Notestein, Frederick Osborn, Dr. Thomas Parran, John D. Rockefeller, III, and Lewis L. Strauss. The Council does not plan to conduct research or educational activities with its own staff, but will make research grants to universities and other organizations and will establish fellowships for the training of students in the field of population.

Film on Data Collection

The Audio-Visual Extension Service of the City College School of Business has released a 15 minute sound film strip in color, entitled "The Collection of Data." This is the first of a planned series of color film strips dealing with elementary statistics. The film goes into methods of collection and tabulation of data, including illustrations of the key-sort method, IBM and Remington Rand machines. It is accompanied by a record and also a mimeographed script for those who may not want to use the sound. The script is by Professor John I. Griffin, who is the technical adviser for the series. The film is available for sale or rental. Inquiries should be addressed to the Audio-Visual Extension Service, School of Business and Civic Administration, City College, 17 Lexington Ave., New York 10, N. Y.

Comparable State Educational Information

A new manual of considerable importance to the language of educational statistics has just been published. It is entitled *Handbook 1, The Common Core of State Educational Information*. This handbook contains the items of educational information with definitions that every State department of education should have available annually. It is a reference to which one may go to find the accepted definitions of certain basic items of educational information that need to be comparable among the States.

The Common Core of State Educational Information is the product of two and one-half years of cooperative effort of representatives of the United States Office of Education, State and Territorial departments of education, and national organizations concerned with educational records and reports. Hundreds of individuals concerned with the problem of comparable educational data

participated in the development of the handbook. Two national conferences, a series of six regional conferences and a conference of representatives of nonpublic schools were focussed on the handbook's development. In addition, the development and implementation of the handbook were considered by the Chief State School Officers at their Washington, D. C. meeting in December, 1952.

The National Council of Chief State School Officers officially accepted Handbook 1 as the fundamental guide for State records and reporting systems. The Council then adopted a resolution urging the State and Territorial departments of education to make prompt and complete use of the common-core terminology for comparable statistical information. Some States have already initiated steps to follow the recommendation of the Council. Such action will improve the basic statistics on education in this country.

The Handbook is being published as Office of Education Bulletin 1953, No. 8. It may be secured from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 35 cents per copy.

University of Chicago Fellowships in Statistics

Three \$1,000 post-doctoral fellowships in Statistics are offered for 1954-55 by the University of Chicago. The purpose of these fellowships, which are open to holders of the doctor's degree or its equivalent in research accomplishment, is to acquaint established research workers in the biological, physical, and social sciences with the role of modern statistical analysis in the planning of experiments and other investigative programs, and in the analysis of empirical data. The development of the field of Statistics has been so rapid that most current research falls far short of attainable standards, and these fellowships (which represent the fourth year of a five-year program supported by The Rockefeller Foundation) are intended to help reduce this lag by giving statistical training to scientists whose primary interests are in substantive fields rather than in Statistics itself. The closing date for applications is February 15, 1954; instructions for applying may be obtained from the Committee on Statistics, University of Chicago, Chicago 37.

Statistical Program for Industrial Research Workers at North Carolina

During the Spring quarter of 1954 (March 24 to June 4) the Institute of Statistics of the University of North Carolina will sponsor a special program of course work, lectures and seminars on statistics for research engineers, physicists and chemists. The primary objective of this program is to provide an opportunity for industrial research workers to acquire a working knowledge of modern statistical concepts and techniques. Emphasis will be on the efficient design of experiments and the analysis of data therefrom. Informal seminars on statistical problems submitted by the participating students will be held. Guest lecturers will include Dr. W. J. Youden and Dr. M. G. Kendall. Regular college credit will be granted for course work satisfactorily completed. For further information write to Institute of Statistics, North Carolina State College, Box 5457, Raleigh, N. C.

Program for Developing Uniform Establishment Reporting

One of the most difficult problems in coordination of Government statistics is the reconciliation of differences in current statistics on manufacturing employment available from various statistical or operating programs. Although certain causes of differences have been eliminated through the development and adoption of a standard industrial classification, standard definitions of employment and production workers, and uniform reporting periods, other discrepancies remain.

Publication of the results of the 1947 Census of Manufactures disclosed considerable discrepancies between the Census data on employment in manufacturing industries and figures published by other agencies. In 1950, under Budget Bureau sponsorship, an Interagency Working Group on Reconciliation of Current Employment Statistics and Census Estimates of Manufacturing Employment was established to undertake a cooperative study of the problems involved and recommended actions which might be taken to resolve the differences. Agencies represented on the committee are the Bureau of the Census, in Commerce; the Bureau of Employment Security and the Bureau of Labor Statistics, in Labor; the Bureau of Old-Age and Survivors Insurance, in the Social Security Administration; and the Bureau of the Budget.

One important source of difference, occurring most often in the estimates for different industries, is inherent in the designation of the individual reporting unit for which figures are submitted. For example, a manufacturing activity that is reported as a single unit to one agency but as two or more units to another, may, as a consequence, be classified and tabulated in different industries. Similarly, a single reporting unit that is described and identified in the same way to various agencies may not in fact be reported to them in an identical manner. Thus the report to one agency by a manufacturing plant may include sales or warehouse activities located within the plant site, but these activities may be omitted in the report to another agency.

Some of these differences in reporting units may be easily resolved since they are not based on real differences of concept or important variations in practice among the agencies. Many, however, have been occasioned by real differences in the program needs, timing of reports, or other requirements of the Federal agencies concerned, and in these instances resolution of the discrepancies requires considerable review of the statistical requirements of the agencies. Other differences result from the different basic record sources used by some companies in compiling data for the various reports.

Analysis for the year 1949 showed that, although the great majority of individual establishments are reported on the same basis, the number of important establishments treated differently was large enough to have a significant effect on the final statistics of some industries. Elimination of these differences would improve the statistics and simplify reporting to Federal agencies by business concerns.

Under the auspices of the Interagency Working Group, an examination was made in 1950-51 of the reporting practices of 14 large multi-unit companies to identify problem areas and also to determine methods of achieving uniform treatment of reporting units. As a result of this examination the Interagency

Working Group in August 1951 established a Subcommittee on Uniform Establishment Reporting. The subcommittee was asked to explore the possibility of obtaining by mail uniform establishment reports for manufacturing and related auxiliary activities from a sample of over 50 multi-establishment companies. The sample was selected so as to yield a wide variety of problems. This test program is concerned primarily with the following reports:

Bureau of the Census—Annual Survey of Manufactures (Form MA-100) and the quinquennial Census of Manufactures. Selected employment information, annual earnings, shipments, materials consumed, capital expenditures and inventories.

Bureau of Old-Age and Survivors Insurance—Employer's Quarterly Federal Tax Return (Form 941) submitted to the Internal Revenue Service. Lists of employees, mid-month employment in the last month of each quarter, and quarterly wages subject to Federal Insurance Contributions Act, grouped and numbered by establishment.

Bureau of Labor Statistics—Monthly Report of Employment, Hours and Earnings (Form BLS 7900 or its State equivalent), usually submitted to cooperating State agencies on behalf of BLS. Current employment, weekly hours and earnings, for a sample of plants.

Bureau of Employment Security—This Bureau does not collect information directly from business establishments, but it establishes the standards under which State employment security agencies collect information quarterly on employment, payrolls, and contributions from employers subject to the various State unemployment insurance laws.

Letters were mailed in August 1951 to the selected companies explaining the purpose of the plan and enclosing a description of the "Plan for Uniform Establishment Reporting to Federal Agencies." The companies were asked to review the plan and the enclosed lists of their manufacturing establishments, make any corrections necessary to bring the lists up to date, and state whether they could report separately for each unit on the list for each of the specified reports. The company replies were examined by the subcommittee, which attempted, on the basis of the information received, to set up a satisfactory list of reporting units for each of the companies. Proposed uniform lists have been cleared with the State agencies concerned. When acceptable lists have been agreed on, by the company and the four agencies involved, copies have been distributed to each of the agencies and to the company, as the basis for uniform reporting on the specified forms in the future.

Progress on the project has been considerably slower than had been anticipated, and by November 1953 final lists had been completed for only 25 out of a total of 61 companies. (Of this total, 53 companies were on the list to which letters were sent in August 1951, 6 were carried over from the original list of 14, and 2 were added because they were parts of an enterprise already included in the project.) Of the 36 cases not completed, there is prospect of fairly early agreement on at least one third. Most of the other cases present problems which require interagency agreement on the most acceptable reporting pattern to follow, or agreement by the employer (in 6 cases) that reporting in accordance with the recommended pattern is feasible. Only 4 companies have either failed to reply or indicated unwillingness to cooperate in the program. Most of the

companies have been extremely cooperative, and a number have indicated that the uniform establishment reporting program will result in more economical reporting procedures for them.

One reason for slow progress in the development of the uniform lists has been lack of sufficient time to devote to the project. It has been recognized from the beginning that efficient operation of the program requires staff time (in addition to the subcommittee's activities) to supervise operations, maintain controls, prepare draft correspondence, supervise preparation of lists, and keep the operation running smoothly. During the two years the program has been operating, however, it has had no budgeted funds, and only the part-time help that participating agencies could contribute.

The difficulty of obtaining interagency agreement on resolution of a number of policy issues has also contributed to the delay in completing the initial project. Among these issues are the treatment of vertically integrated operations (such as integrated blast furnaces, steel works and rolling mills), which present problems of segregating common services or common processes. Problems in industrial classification have also arisen, and have been referred to the Technical Committee on Standard Industrial Classification.

Work of the Subcommittee on Uniform Establishment Reporting was reviewed by the Interagency Working Group on September 18. After consideration of all the problems involved, particularly the lack of staff and funds, it was decided that for the present the uniform establishment program should not be extended to include additional companies. The Interagency Working Group did, however, approve an interim program proposed by the subcommittee, with emphasis on resolution of existing policy issues, completion of cases which give promise of fairly early solution, and postponement of further action on remaining difficult cases. A further report will be made by the subcommittee at the completion of the interim program.

Present members of the Subcommittee on Uniform Establishment Reporting are: Maxwell R. Conklin (chairman) and Harold Goldstein, Bureau of the Census; Margaret E. Martin, Bureau of the Budget; John T. Murray, Bureau of Employment Security; Maurice F. Bresnahan and Abe Rothman, Bureau of Labor Statistics; and John J. Noonan, Bureau of Old-Age and Survivors Insurance.

MARGARET E. MARTIN,
*Office of Statistical Standards,
Bureau of the Budget*

BLS Technical Note on Measurement Of Industrial Employment

A revised technical note describing the methods and procedures used by the Bureau of Labor Statistics in the measurement of industrial employment appeared in the September 1953 issue of the *Monthly Labor Review*. These series were recently adjusted to first quarter 1951 benchmarks, at which time modifications were made in the estimating procedures and coverage was extended to additional industries. The technical note includes a discussion of concepts, scope, survey methods, uses and limitations of the series.

Reprints of the technical note are available on request to the Bureau of Labor Statistics, Washington 25, D. C.

DUDLEY E. YOUNG,
*Assistant Chief for Statistics, Division of Man-
power and Employment Statistics, Bureau of
Labor Statistics, Department of Labor*

Series P-E Bulletins from the 1950 Census of Population

The Bureau of the Census has published a group of special reports based on the 1950 Census of Population. Reports in this series, P-E, are designated as preprints of chapters of Population Volume IV. At the present time the reports are available only in preprint bulletin form, and not in bound volume form. In contrast with other series of Population Census reports wherein each bulletin represented a compendium of basic data for a State or other area, each bulletin in Series P-E presents a detailed treatment of a particular subject, usually without data for small areas. Published bulletins in Series P-E include:

- P-E No. 1A—Employment and Personal Characteristics
- P-E No. 2C—Institutional Population
- P-E No. 2D—Marital Status
- P-E No. 3B—Nonwhite Population by Race
- P-E No. 3C—Persons of Spanish Surname
- P-E No. 3D—Puerto Ricans in Continental United States
- P-E No. 4A—State of Birth
- P-E No. 5A—Characteristics by Size of Place
- P-E No. 5B—Education

Other planned reports in Series P-E, not yet ready for publication, cover occupational and industrial characteristics, characteristics of families, nativity and parentage, mobility of the population, and fertility.

The bulletins are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Descriptions of the bulletins and order blanks showing the price of each bulletin may be obtained from the Bureau of the Census, Washington 25, D. C.

EDWIN D. GOLDFELD, *Assistant to the Chief,
Population and Housing Division, Bureau
of the Census, Department of Commerce*

Revision of the Census Bureau Monthly Wholesale Trade Survey

A major improvement now being made in the Monthly Wholesale Trade Survey of the Bureau of the Census will make it possible to provide direct estimates, from a sample, of the dollar volume of sales and end-of-month inventories for total merchant wholesale trade and for some 35 kinds of business. In addition, trends of identical establishments in important kinds of business will be provided for the broad geographic regions of the country.

The revised wholesale trade program will be based on a fixed panel of about 1,000 large wholesalers each month, plus four rotating panels, each of about 4,500 wholesalers and each reporting a different three months during the year. The panel will be limited to wholesalers with one or more employees and will be drawn from 1948 Census of Business records and "births" derived from the reporting system of the Bureau of Old-Age and Survivors Insurance. The total panel of some 19,000 to 20,000 firms in the panel also will be covered in the Annual Wholesale Trade Survey planned for 1953.

The first release of data on the revised basis will be made during the first part of 1954. October 1953 will be the first month in the series; after the first publication, monthly figures will be released about 30 days after the end of the month being covered. The revised series will replace the percentage trend figures now issued, based on reports from identical establishments.

HARVEY KAHLEN, *Acting Chief,
Business Division, Bureau of the
Census, Department of Commerce*

Long-Range Cost Estimates for Old-Age and Survivors Insurance

The Division of the Actuary, Social Security Administration, has recently published Actuarial Study No. 36, "Long-Range Cost Estimates for Old-Age and Survivors Insurance, 1953." The cost estimates presented in this study relate to the 1952 amendments. Four separate cost illustrations were developed, in order to have appropriate ranges in benefit costs, both as to dollar amounts and relative to payroll. Various assumptions were selected so as to be consistent with the actual operating data. The authors point out that, as in previous studies, the figures developed do not represent the widest possible range that could reasonably be anticipated, but rather their studied opinions as to a plausible range.

Copies of this study may be obtained from the Division of the Actuary, Room 5121, Department of Health, Education and Welfare, Washington 25, D. C.

ROBERT J. MYERS,

Chief Actuary, Division of the Actuary, Social Security Administration, Department of Health, Education and Welfare.

Supplements to the Survey Of Current Business

Four supplements to the *Survey of Current Business* have recently been published by the Office of Business Economics, Department of Commerce—"Business Statistics, 1953 Biennial Edition," "Foreign Investments of the United States," "Income Distribution in the United States," and "Income of Hawaii."

"Business Statistics" is the ninth in a biennial series of statistical supplements to the *Survey*, and will be the basebook to which the 2,600 series regularly published in the 40-page Monthly Business Statistics Section of the *Survey* will be keyed. For each of these series the supplement presents monthly data from January 1919 through December 1952 and annual averages of monthly data from 1935 through 1952. The supplement also contains comprehensive descriptions and explanations of the series, including definitions of the statistical units employed, methods of collection, adequacy of samples, and other information essential to proper use of the data.

"Foreign Investments of the United States" is the fifth in a series of studies of direct investments abroad and gives the detailed results of a mandatory census of American direct private investments abroad as of the end of 1950. This census was broader in scope than earlier studies and gives data on capital movements, earnings and structure, as well as a full set of country and industry figures for the book value of the investments. The supplement contains analytical chapters on the background of the direct investments abroad, their country and industry distribution, financial structure and ownership, earnings and income remittances and capital movements; and extensive ap-

pendix sections dealing with problems of definitions, sources and methods, and comparisons with previous estimates.

"Income Distribution in the United States" presents estimates consistent in definition and coverage with the regular personal income series, showing the size distribution of income in the years 1944, 1946-47, and 1950. Focusing on a factor which is a major determinant of consumer demand, the new series show the distribution of the Nation's purchasing power according to the size of family income. These estimates will be maintained annually in the *Survey of Current Business*.

"Income of Hawaii" was prepared by the Office of Business Economics at the request of the Territory of Hawaii to establish figures on Hawaii's personal income comparable to those regularly published for the States each August in the *Survey*. The report gives a comprehensive measure of the Hawaiian market, and throws new light on regional economic differences and patterns of change.

None of these supplements is included in the annual subscription to the *Survey of Current Business*. Copies of each may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at the following prices: "Business Statistics"—\$1.50; "Foreign Investments of the United States"—50 cents; "Income Distribution in the United States"—65 cents; and "Income of Hawaii"—55 cents.

JAMES W. McNALLA, Assistant Director,
Office of Business Economics,
Department of Commerce

New BLS Series: Indexes of Aggregate Weekly Man-Hours

A new statistical series, indexes of production-worker aggregate weekly man-hours, was introduced by the Bureau of Labor Statistics in the October issue of its "Hours and Earnings—Industry Report." The indexes provide a composite measure of the trends in both production-worker employment and average weekly hours, and supplement the employment and hours series, published monthly as part of the BLS employment statistics program.

The new series will be published monthly for total manufacturing, the durable and nondurable goods subdivisions, and the 21 major manufacturing groups. The October Report contains annual averages for the years 1917 through 1952, and monthly data for the latest 14 months. Monthly data beginning with January 1917 for each of the 21 series are available upon request to the Bureau of Labor Statistics, Washington 25, D. C.

DUDLEY E. YOUNG,
Assistant Chief for Statistics, Division of Manpower and Employment Statistics, Bureau of Labor Statistics, Department of Labor

STATISTICS AND SOCIAL FORCES*

By STUART A. RICE

The International Statistical Institute is again meeting in the continent of its birth, in the great world capital in which it held its first session. It last met here 28 years ago. In these times of instability of human institutions, Rome, the Eternal City, is an ageless symbol of permanence and continuity. I think it a good omen that we should meet here for the third time.

It is especially pleasing to be the guests of a great nation which has at its head a leading representative of our own profession — our distinguished fellow member, whose notable message I have had the honor of reading to you, President Luigi Einaudi. On behalf of all my colleagues, especially those from other lands, I wish to thank President Einaudi for his friendly greetings and to assure him that we have received his wise counsel with close and sympathetic attention and with warm appreciation. I beg him to accept our salutations and to receive for his Government and for the statisticians of Italy our thanks for the splendid and hospitable preparations they have made for this session.

Along with anticipations of pleasure and intellectual profit from the scheduled meetings and events I approach with mingled emotions the close of a momentous period in my own life. Fifteen years ago, amid gathering clouds of war, the International Statistical Institute abruptly ended its 24th Session at a midnight meeting in the Hotel Alcron at Prague. This event, which foreshadowed tragedy for so many, left me with responsibilities that were not discharged until the Washington Session, nine years later; and that led, in the chain of circumstances, to my election by the Institute as its President.

As I prepare to relinquish that office I wish again, sincerely and humbly, to express my gratitude toward associates present and absent for the unmerited honor and for the trust and support they have so long accorded me. I pay homage especially to the Institute's distinguished Honorary Presidents, Arthur Bowley, H. W. Methorst, and Walter Willcox, and to the memory of my late and deeply-lamented friend, former President Armand Julin.

Since that night in Prague a decade and a half ago, items of enormous magnitude have been posted on both sides of the ledger of human affairs. The debits have been inconceivably great: millions of dead; staggering material losses; aggregates of human misery for which we lack any unit of measurement; failures to develop social guidance of the use of stupendous technical achievements; the emergence of new centers of evil power from the very process of resisting evil; frightening imponderables—irrationality, anti-intellectualism and spiritual devaluation; and hovering over all of this the ghastly possibility of another and greater war which may destroy civilization and even the human race itself.

I do not contend that these debits can be counterbalanced on the credit side of the ledger. The deficit is large; yet the credits are substantial.

Scientific and technical advances have been noteworthy, though perhaps no greater than they would have been had the war been avoided. A more certain gain is the invention of improved machinery for the maintenance of peace and the management of the world's common affairs. The United Nations, the Food and Agriculture Organization, the International Labor Organization, UNESCO, the World Health Organization, and the other "specialized agencies" are great international ministries. They are weaving and expanding the network of human relationships out of which, we may dare to hope, Alfred Lord Tennyson's "federation of mankind" will some day evolve. For the first time in history an intergovernmental authority has been able to resist aggression and protect the collective security. Related to these tangible evidences of men's yearning for a peaceful and orderly world has been an unprecedented awakening of interest in human well-being and betterment.

It is still too early for a trial balance between these debits and credits; but some of the underlying forces now shaping the future can be recognized and some of their effects upon the work of statisticians can be predicted. The forces to which I refer particularly are *sociological*. Perhaps you will permit me to be illogical and call them *social forces* in contrast to *economic*, although the latter are equally entitled to be known as "social."

* Presidential Address, 28th Session of International Statistical Institute, Rome, Italy, September 6, 1953.

What I wish to point out is that subtle changes in social conceptions, attitudes and ideals are determining the uses that will be made of advancing technology and the controls that will be exercised over the biological and economic factors in human evolution. They are pulling the world simultaneously toward destruction and toward a brighter day. The measurement of these social or sociological forces—of their directions, interactions, changes and results—poses problems for statisticians which are only partly new but which have taken on new significance. It calls for considerable revision in our habits of thought.

Many economic phenomena, with varying precision, have been statistically defined, measured, and then related to economic objectives in a manner not wholly dissimilar from business accounting. This is good; but statistical evaluations of numerous social phenomena of equal or greater importance for human life have been neglected or, when attempted, have been regarded as unsubstantial or esoteric.

Such critical determinants of human life and welfare as group consciousness, nationalism and patriotism; as interactions among group loyalties and the expansions or contractions of the areas in which they dominate; as attraction and repulsion between individuals and between groups; as differences, similarities and temporal changes in group folkways, mores and attitudes; as stereotyped conceptions of other peoples; as conceptions of the Deity and patterns of devotion thereto, together with loyalties to earthly institutions; as trends in literature, art, personal habits and behaviour—are but slightly represented in our store of statistical tables, correlations and indexes.

This is only in part a consequence of neglect. Some of the difficulties in measuring social forces are inherent and the inattention to social as contrasted with economic phenomena is only relative. Research upon public opinion—a social phenomenon preeminent—has taken notable strides in developing its methodology. Even more notable have been forms of economic analysis which involve social values in their operational conceptions and which produce data that are widely employed as indexes of social well-being. Estimates of national income and of individual income distribution provide examples. In the course of developing such estimates new importance has been given to the analysis of family budgets and living standards; and to the collection of data on family incomes, expenditures, consumption and savings.

Nevertheless, statisticians as a group have not yet devoted to the measurement of social phenomena the same attention and skill that they have applied to measurements in economics. An illustration of the needs to which they have not yet seriously responded may be found in programs of technical assistance to underdeveloped and underprivileged peoples.

The world has rediscovered the ancient truth that the well-being of every nation and people is intertwined with the well-being of every other. We are all—economically and politically as well as spiritually—our brother's keepers. Technical assistance is a political expression of this rediscovery.

My deeply religious parents were solicitous for the welfare of those whom they regarded as underdeveloped and underprivileged respecting salvation. They relentlessly sought the Christianization of non-Christian peoples. Results of the missionary movements that they supported were measurable in simple census terms by counts or estimates of the numbers of the saved and the unsaved.

Present-day assistance programs have more complex and less clearly defined objectives. They have made infrequent provisions for measurement of their results and the inevitable questions are now being asked: What are expenditures for assistance designed to accomplish? Can the success of the accomplishment be measured, and how? Can the relative needs of different areas, or of the same area for different programs, be determined? Responsible leaders wish to know—and they seldom can find data on which to base a judgment—whether a given sum will advance welfare more if expended for Program A or Program B, in country X or country Y.

The *Economist* of London recently asked for "clearer principles for spending these international funds." Asserting that much of the effort is currently devoted to increasing economic output, the *Economist* suggests that "industrial production would rank rather as a means than an end . . . It ought to be possible to set up some kind of a rough mathematical scale of real needs."¹

I hear in these words a distant echo of English utilitarianism. Assistance programs are intended to produce "utility" as defined by Jeremy Bentham—"to produce benefit, advantage, pleasure, good or happiness . . . or . . . to prevent the happening of mischief, pain, evil or unhappiness . . ." But how may "real needs," real increases in welfare or "utilities" be identified and counted or reduced to scales and measured?

Not alone by the level of national income or its growth. President Einaudi called our attention to the dependence which in recent years has been placed upon national income estimates for many diverse and important purposes. His reasons for caution in using these estimates may be supplemented by others: We cannot say that gains in national income mean proportionate gains in welfare, for the analogy between national income and individual or family income may be fallacious.

¹"Uno Passes the Hat," *The Economist*, March 7, 1953, Vol. CLXVI, pp. 642-3.

Within a group of economically related individuals in an industrialized society, individual income provides an approximate measure of comparative economic well-being. Most of the nation's products and services flow through established markets where they are valued precisely by monetary transactions. Differences in the income received by individuals reflect corresponding differences in their ability to procure goods and services which satisfy many needs.

In "underdeveloped" countries only a small share of the national product usually goes through established markets at monetary prices. The dominant share consists of foods and other goods that are produced and consumed directly. There are few market transactions to provide a firm foundation for imputing monetary values to direct consumption. The conception of monetary income in such a society is thus unrealistic, even as an indicator of individual welfare.

It is indefensible for still another reason to assume that the national or per capita incomes of two countries will reflect the relative well-being of their inhabitants. The United Nations Statistical Office has called attention to the upward bias in national income estimates that results from industrialization. It asserts² that "differences in per capita income between countries should not be used as a direct measure of differences in living standards . . . Distributive and other services that are important in the industrialized countries are relatively unimportant in underdeveloped areas and thus tend to inflate the incomes of the former without necessarily raising the living standards correspondingly."

Can one say that the satisfaction of hunger is less if a farm family has produced and ground its own grain and consumed the bread therefrom, without the intervention of paid harvesting crews, commercial elevators, millers, bakers, and retailers—all of whom would have generated income at each transaction between them?

In brief, gains in national income measure increases in money flows; they do not precisely nor even necessarily measure gains in social well-being.

Nor can it be assumed that increases in the satisfaction of "real needs" result from industrial development. The latter has seemed to some people, particularly in underdeveloped countries, to be a sufficient goal of technical assistance. The idea may be congenial also to statisticians, for industrial growth is measurable by a number of their recognized procedures: censuses of production, reports on the industrially employed, etc.

However, the Director-General of the International

Labor Office has shown³ that the processes and consequences of industrial development are not simple. "Efforts, sacrifices and readjustments in their ways of life . . . must accompany economic development for the people of underdeveloped countries." "The promise of ultimate prosperity for all at some indefinite future date is not enough to carry whole peoples through the change and upheaval . . ." that are involved.

Readjustments in ways of life within the industrializing country, moreover, may be only part of the total costs of development. Other nations may experience in their own economies such results as shortages of raw materials, disappearances of markets, pressures on food supplies and overpopulation. Once again, who is to determine and how are to be determined the scales of values by which the "real needs" or the changes in satisfactions and dissatisfactions resulting from development programs are to be measured?

I do not believe that general answers can be given to these questions. Superior wisdom may not reside in those with funds to allocate, although their judgments must determine the allocation. The desires of candidates for assistance are far from an adequate guide to "real needs," though they should always be given sympathetic consideration. Answers are more satisfactory when science has developed impersonal standards upon which grantors and grantees can agree, as often in the fields of medicine and public health.

I am unable to find a term which is both precise and comprehensive enough to describe and delimit the area of statistical development that can be anticipated as a result of the growing awareness of conflicting social forces and the increasing emphases upon social welfare. "Welfare statistics" will to some convey too narrow a meaning; "social statistics" is too broad and indefinite. Specifications for this statistical development, moreover, would be premature. Research, experimentation and fact-finding by many workers and the slow accretion of their results should bring clarification. Nevertheless I offer some suggestions:

1. There is no theoretical impediment to the statistical investigations that are needed. No inherent differences in kind exist between the statistical measurement of a social force like love for freedom, an economic force like market demand and a physical force like electricity. To a statistician, all of these are known and knowable only by the effects they produce. Measurements in each case are indexes of "a hypothetical world of reality beyond the reach of sense impression."⁴

³ *World Labour Report*, 1953.

⁴ *Quantitative Methods in Politics*, by Stuart A. Rice. Chap. III, "A Statistical View of a Perceptual World."

² *Monthly Bulletin of Statistics*, June 1952.

2. In measuring advances in human welfare it is futile to grasp for absolute standards of appraisal. They will continue to elude us. Our points of reference are value systems which may differ from individual to individual, from place to place, and from time to time. For example, preferred standards of masculine virtue, feminine pulchritude, artistic excellence and oratorical prowess are notoriously variable. The achievements to which a Western youth aspires are often dissimilar from those before the mind of his Eastern counterpart; and vice versa.

A statistical index of progress toward the attainment of ideals and aspirations is thus in danger of exhibiting gains which may later be transmuted into retrogression. To minimize this risk, it seems to me, our primary point of reference should be that value upon which there is the widest agreement. For the governments of free nations and for the peoples of all nations, I believe this to be *human life*, posited as a good in itself.

I have elsewhere⁵ referred to the "natural or physical conditions of certain minima of existence." I called these the elements of a "*minimum* minimum standard of living." They include "certain ranges of altitude, of heat and cold, of access to food," and so on. Many of these elements—the means, in general, for the survival and prolongation of life—are capable of examination, of international comparisons and of comparisons over time by quantitative methods. Mortality rates, life expectancy at birth and life expectancy at any subsequent age level provide crude measures of the combined efficiency of all elements which contribute to human survival.

3. Crude measures like those just named are often susceptible of statistical refinement. They can be broken down, factored and made more meaningful by analysis. To illustrate: the number of calories in the per capita food consumption of a people is often cited as an index of its relative well-being. So large a proportion of the world's population is now underfed that this interpretation is at present approximately valid. Yet as individuals we may have learned the importance of certain minerals and vitamins in our foods, the importance of balance among our food components, and the fact that hazards to health may result as surely from too many calories as from too few. A goal of research for nutritionists and statisticians should be the development of means to measure dietary adequacy for different types of people in different situations in terms of variation (a) from the optimal

number of calories required, and (b) from the optimal balance among nutritive elements which is required by the circumstances of their lives.

4. Man does not live by bread alone. Above and beyond the components of the minimum minimum standard of living are elements upon which the highest intellects and the most sensitive spirits in the world's history have placed a higher valuation than even life itself. This fair land of Italy has proud traditions of great artists who sacrificed personal consumption to create the outward expressions of beauty that tormented their imaginations; and of saints who sought peace of spirit in communion with God at the expense of their bodies. Every day, along widely extended frontiers, multitudes of people are showing their willingness to exchange incomes and savings for freedom.

It is values like these which markedly differentiate man from lower species of life. Can progress toward the goals that they set for us be statistically measured? A number of direct or indirect indexes are possible. For example, negative indexes of that "personal freedom and respect for human dignity," whose attainment is one of the official objectives of my country's international assistance program are provided in the recent United Nations Report of the Ad Hoc Committee on Forced Labor.⁶

Professor Simon Kuznets has suggested that the ranges of economic choice available to an individual, whether in his purchases of goods or his choice of a vocation, might serve as another kind of index of individual freedom. Statistics assembled by UNESCO provide various indexes of the social valuations placed upon educational, spiritual and cultural interests. I am sure that search would disclose other possibilities.

5. The services of which statisticians are capable need recognition in areas with which they now have only limited contacts. International welfare and assistance programs have real needs for statistical services but seldom obtain them. Statisticians are needed both to help plan such programs and to assist in appraising their results. And since technical assistance is a stop-gap device, the statisticians engaged have responsibilities for training successors to leave behind them.

The foregoing propositions scarcely indicate the enormous complexity of social forces and of the tasks of measuring them. In commenting upon a draft of this paper, Professor G. Goudswaard stresses the "multi-dimensional" character of the notions involved. I might say they are multi-multi-dimensional. A few days ago I was privileged to read a draft of the eagerly

⁵ "Standards of Living as Functions of Science and of Social Organization," *Science*, Vol. 90, pp. 167-172, Aug. 25, 1939. The phrase quoted is that of Carl Brinckmann, author of the article on "Standards of Living" in the *Encyclopedia of the Social Sciences*.

⁶ United Nations Economic and Social Council, *Official Records*, Sixteenth Session, Supplement No. 13 (E/2431).

awaited *Report on International Definition and Measurement of Standards of Living*, prepared by a Committee of Experts meeting at United Nations Headquarters, 8-26 June 1953, and soon to be published in revised form. I was gratified to discover in it, along with a thorough elaboration of the issues, many findings with which my own observations in the present paper are consistent. I commend the forthcoming Report and cite it as a general reference upon my topic.

As a tangible point of immediate attack upon this vast and complex range of issues, I suggest the importance of securing a fuller utilization of the services of statisticians in international welfare and assistance programs. A better balance can then be expected in the distribution of prestige between economic and social statistics, together with the development of clearer conceptions of the scope and functions of the second. Social statistics are relatively undeveloped; but they also are relatively undefined. A higher priority for them in the work of the United Nations Statistical Office was urged by the Statistical Commission a number of years ago. I think it fair to say that the

request caught the Office unprepared to meet it; but the Commission was equally unprepared to amplify and defend the judgment it had expressed and to provide the Office with interpretation and guidance. The Commission's request is now beginning to bear fruit, as evidenced in the excellent Review of National and International Statistics⁷ presented at its Seventh Session by Dr. William R. Leonard in the name of the Secretary-General. For the progress he disclosed several of the UN specialized agencies should share the credit.

In conclusion, it is pleasing to express the belief that the International Statistical Institute, its members and its affiliated organizations have missions of profound importance to perform in the grand strategy of human survival. It has been said that "Ye shall know the truth and the truth shall make you free."⁸ It is our responsibility and our opportunity to discover truth which is needed for the advancement of human welfare everywhere. Thus we may help to free mankind from want, malevolence and fear.

⁷ E/CN.3/148, 22 January 1953.

⁸ John 8:32.

INTRODUCTION TO THE THEORY OF GAMES

By J. C. C. McKINSEY
Stanford University.
382 pages, \$6.50

Deals with the mathematical theory of strategy. The mathematical apparatus developed by the author will find application not only in the pure form of parlor games of strategy (chess, bridge, poker, etc.), but also in economics, statistics, and the theory of military strategy.

PROBABILITY AND INFORMATION THEORY, WITH APPLICATIONS TO RADAR

By P. M. WOODWARD, Principal Scientific Officer, Telecommunications Research Establishment, Ministry of Supply, Malvern, England. *Electronics and Waves Series*. In press

This book explains in easy stages how the theory of probability applies to electronics, communication, and particularly radar. It was prepared for the reader with no highly-advanced mathematical knowledge who is interested in linking his practical "intuition" with precise mathematical theory.

PRINCIPLES OF NUMERICAL ANALYSIS

By ALSTON S. HOUSEHOLDER, Oak Ridge National Laboratory. *International Series in Pure and Applied Mathematics*. 274 pages, \$6.00

Here is a senior-graduate text which develops the mathematical principles upon which many computing methods are based and in the light of which they can be assessed. Directed primarily toward digital computation the book is designed to give a unified treatment rather than a complete catalogue of methods. Treatment is primarily theoretical. Techniques for making estimates of errors are indicated wherever possible. Functional equations as such are not discussed, but emphasis is placed upon the methods of solving the finite systems and performing the interpolations which are required in the digital solution of functional equations.

McGRAW-HILL BOOK COMPANY, INC.

Send for copies on approval

330 West 42nd Street, New York 36, N. Y.

THE REVIEW AND COORDINATION OF DATA COLLECTING ACTIVITIES SPONSORED BY THE FEDERAL GOVERNMENT¹

By HARRY ALPERT, National Science Foundation

Federal funds for support of social science research and development at non-profit institutions reached \$10.2 millions in 1952.² Only a small proportion of this total expenditure involved data collecting activities. Best estimates of expenditures for data collections sponsored by the Federal Government, and carried out under research contracts or grants, suggest a figure of approximately \$2.25 millions per year.

This paper deals with the problem of what policies and procedures should be adopted by the Federal Government with respect to the review and coordination of these sponsored data collecting activities. The problem arises as an extension of the regular responsibilities of the Office of Statistical Standards of the Bureau of the Budget as the central coordinating agency of the Federal statistical system. No attempt will be made here to describe the work of the Office of Statistical Standards, since this has been done quite adequately elsewhere.³ Suffice it to say that the O.S.S. has general responsibilities to coordinate and improve Federal statistical services, to eliminate duplication and to minimize the burden of furnishing information to Federal agencies. The purposes of review by O.S.S. include avoidance of unwarranted cost and unnecessary duplication and improvement of the quality and general usefulness of the statistics obtained. Among major concerns are the improved accuracy of governmental statistics and the more effective and economical utilization of public funds devoted to statistical activities. The goal is the creation, to the greatest degree possible, of a coordinate body of data, in all fields, which will be of maximum usefulness to research workers, and to businessmen, government officials, and others who require accurate information as the basis for administrative decisions.

The Office of Statistical Standards (O.S.S.) under-

takes review of data collecting activities sponsored by Federal agencies by virtue of responsibilities assigned to it under the Federal Reports Act of 1942, Budget Bureau Circular No. A-40 (Revised), Section 103 of the Budget and Accounting Procedures Act of 1950, Executive Order No. 10253, June 11, 1951, and Budget Bureau Circular No. A-46.

In the judgment of O.S.S., data collections included in contracts and grants sponsored by Federal agencies are closely related to the Federal statistical system, and must be coordinated with that system in order to avoid unnecessary duplication, unwarranted expenditures and excessive burden on respondents and in order to protect the respect and confidence of the general public in the integrity, soundness and economical operation of the data collecting activities of the Federal Government.

It is the firm desire of O.S.S. that review of federally sponsored data collections be undertaken with minimum administrative machinery, with the least possible burden on contractors and grantees, and without interference with the flexibility, spirit of experimentation, and independence of inquiry which are essential to a sound program of scientific research.

Review and coordination are essential features of good survey practice. The survey planning process must of necessity include provision for these integral steps of proper survey design. The survey planning calendar should provide an adequate time allowance for the review and coordinating functions.

Coordination has been properly defined by S. A. Rice as "the detailed adaptation to each other of two or more statistical inquiries that are related in purposes, methods, sources of data, results, or the use of their findings."⁴ In actual practice it means consultation with colleagues in the Bureau of the Budget, in-

¹ Revisor of paper read at 112th Annual Meeting of the American Statistical Association, December 27, 1952. This paper was prepared while the author was a member of the staff of the Office of Statistical Standards of the Bureau of the Budget. It does not necessarily represent the views of the National Science Foundation.

² See National Science Foundation, *Federal Funds For Science*, J. Government Printing Office, Washington, 1952.

³ See Statistical Services of the United States Government, Bureau of the Budget, Washington 25, D. C., Revised edition,

1952 (available from Superintendent of Documents), pp. 7-13; Rice, S. A., "The Role and Management of the Federal Statistical System," *American Political Science Review*, 34, 1940, pp. 481-488; Alpert, H., "The Federal Statistical System," *American Journal of Sociology*, 56, 1951, pp. 468-475; Linnenberg, C. C., Jr., "The Development of Federal Statistical Coordination, 1908-49," in *The American Statistician*, 3, April-May and June-July, 1949; Rice, S. A., "Co-ordination of Federal Statistical Programs," *American Journal of Sociology*, 50, 1944, pp. 22-28.

⁴ *Hearings on Independent Offices Appropriations, 1951, Subcommittee of the Committee on Appropriations, United States Senate, 81st Congress*, p. 409.

terested staff in other Federal agencies, professionally competent experts both inside and outside the Federal Government, interagency committees in numerous specialized areas, advisory committees from business and labor and the American Statistical Association, and the O.S.S.'s own panel of some 17 expert consultants.

Review, in the framework of data collecting activities, is the process by which, within the limits of available time, personnel and cost, the maximum amount of expertness is brought to bear in the formulation and execution of a particular plan for collecting data. Review is the expert look-see from the outside which insures a fresher perspective, additional experience, and fuller exploitation of available know-how. No one person or organization can possibly know all the answers, let alone be in a position to raise the appropriate questions. This is surely true of O.S.S. It is basic to the mode of operation of the O.S.S. that no staff member regards himself as an all-knowing authority in a particular field. Rather, as a staff member, he assumes the obligation of becoming as well informed as possible on where the expertness in his areas of responsibility resides and how it can be most effectively tapped.

It is essential that review and coordination, as here defined, be viewed as integral features of all survey design. Review and coordination have, without doubt, been potent factors in raising the level of professional efficiency of the federal statistical system. It has been suggested that the experiences of O.S.S. in this area might well be studied by business, industry, universities and other organizations interested in proficient survey design and in the elimination of waste and inefficiency in statistical activities.

What procedures should O.S.S. adopt to insure that the review and coordination of federally sponsored data collections is most efficiently administered in the light of the policy objectives of minimum administrative burden, maximum flexibility, and full respect for the experimental spirit and for the freedom of inquiry essential to sound scientific research?

An initial question is whether the same procedures should apply equally to contracts and to research grants. Unfortunately, it is impossible, in the light of present statutes and administrative regulations to draw exact distinctions between the *contract* or *procurement* type of Federal sponsorship, whereby the data collecting activities are requested by an agency in connection with an operating program and the *basic research grant* type of sponsorship, in which the role of the Federal agency is essentially one of support of basic scientific research. The fact that a particular arrangement is designated as a contract or a grant does not reflect its essential nature. However, despite this terminological difficulty, it is possible, on the basis of

broad intentions, to distinguish between the *purchase* type of sponsorship and the *support* type of sponsorship and to establish distinctive procedures for review of these two types of sponsored data collecting activities. O.S.S. maintains that, on the whole, the general rules of review applicable to the regular statistical activities of Federal agencies should be applied to the contract or procurement type of data collection, whereas extreme flexibility, maximum experimentation and a minimum of interference should be involved in the review of grants which include data collecting activities.

To insure a minimum of administrative burden, especially with respect to research grants, O.S.S. has resorted to such devices as (1) waivers; (2) agency self-policing procedures; (3) post-audit review; (4) advisory review; and (5) informational submittals. Special interest attaches to the development of agency self-policing procedures.

As part of its effort to encourage Federal agencies to set up self-policing procedures,⁵ the O.S.S. has worked out with the National Institutes of Health a delegation of review responsibilities to a Committee on Standards for Grants Surveys. This is a Committee of the National Institutes of Health. A representative of O.S.S. is invited to attend its meetings and to participate in its deliberations, but is not a member of the Committee and does not vote. The present membership of the Committee consists of two social scientists and two statisticians from the Public Health Service, and two non-governmental specialists. The Memorandum of Understanding Between NIH and O.S.S. became effective July 1, 1952. It provides for a substantial number of waivers and spells out the types of surveys which are included in the responsibilities of the Committee on Standards for Grants Surveys. The Committee is given the mandate to review the research grant applications referred to it with these objectives: assurance of sound statistical design; assurance that the proposed study does not undesirably overlap other studies; assurance that the study does not invade the rights of individuals to privacy; and other assurances of sound statistical practice. The Committee recommends such modification of experimental design or additional special measures as it deems necessary to achieve these objectives. The applicant for a research grant is notified of these recommendations and if he elects to accept the grant with the proposed amendments the award is made provided the application satisfactorily meets the other requirements of NIH. This is, frankly, an experi-

⁵ The Budget Bureau has consistently encouraged Federal agencies to set up their own central coordinating units. See Crowder, E. T., "Centralized Internal Control of Data Collection by Federal Agencies," *Journal of the American Statistical Association*, 39, 1944, pp. 155-64.

mental mechanism. O.S.S. and NIH have agreed to review jointly their experiences under it at the end of a two-year period.

In exercising its review responsibilities, should O.S.S. use standards similar to those it uses in the review of surveys conducted directly by Federal agencies? As part of its general program O.S.S. has promulgated standard definitions and classifications in order to insure greater comparability of data from numerous different sources. Some examples are:

- Standard Industrial Classification
- Standard Commodity Classification
- Standard Definitions of Metropolitan Areas
- Standard Definitions of Employment and Production Workers
- Standard Payroll-reporting Period
- Standards for the Publication of Statistical Data

It has also established guides to good statistical practice in the planning and conduct of statistical surveys.⁶ This guide list is applicable both to surveys conducted directly by Federal agencies and to those conducted under Federal sponsorship by contracting organizations and grantees. However, in the application of standards to surveys in the basic research grant area, dominant consideration must be given to the needs for flexibility, experimentation, "blind-alley" exploration, and other requirements of scientific progress.

Two questions which arise in connection with O.S.S. review of sponsored data collections are: (1) the role of the principal investigator in contract and grant research and (2) the issue of academic freedom.

In many instances, particularly if more than one contract or grant is awarded to an individual or organization, the principal investigators have not been able to give sustained personal direction to the project and have turned over the planning and execution of research to less experienced persons. Graduate students, younger faculty members and others have been asked to undertake rather complex and difficult research

⁶ Issued as Exhibit A to Budget Bureau Circular A-16; available from Publication Unit, Bureau of the Budget, Washington 25, D. C.

assignments. This has resulted in inferior end results and in failure to utilize one of the main reasons for awarding the contract or grant in the first place, namely, the technical and professional skills of the officially designated principal investigators.

The principal investigator working under a federally sponsored research contract or grant has an obligation to give sustained personal direction to the project. One of the major factors in awarding the contract or grant in the first place is to take advantage of his technical and professional skills. These skills should not be dissipated.

With respect to academic freedom, it should be noted, first, that academic freedom includes the freedom *not* to accept or to seek Federal funds for contract or grant research. Acceptance of public funds entails a necessary obligation to abide by the Government's professional rules of the game, i.e., rules of the game as laid down by the experts who have advised the Government in the interest of economy and efficiency.

It is for the express purpose of fostering and promoting scientific research that the procedures here described for review and coordination have been introduced. If one accepts our fundamental thesis that review and coordination are essential features of good survey procedure, if one recognizes that these processes are best carried on in the spirit of mutual discussion of technical matters by qualified professionally trained experts rather than by administrative ukase, then one must recognize review and coordination as basic contributions to the further progress of scientific research and inquiry.

All statisticians have an interest in the integrity of Federal statistics and their interpretation. The public will judge and will accord full faith and credit to government statistics only to the extent that it is convinced of their honesty and quality.

Bad statistics, no matter by whom produced, reflect on all statistics. Statisticians, both governmental and academic, have a common objective: to serve society by providing it with the finest body of solid, meaningful facts we are capable of producing.

EXTENT AND CHARACTER OF ERRORS IN THE 1950 CENSUS¹

By A. ROSS ECKLER, Deputy Director of the Census

It has become a generally accepted principle among professional statisticians that a compiling agency has responsibility for furnishing adequate information regarding the limitations of the data which it collects and publishes. The present policy of the Bureau of the Census is to provide as consistently as possible measures of the accuracy of all censuses and surveys which it conducts. In this connection it has supported the Bureau of the Budget in the desire to establish this kind of standard for all government statistics. Since 1945 we have conducted quality checks for all of our censuses.

However, an objective point of view relating to error is not a new development. In this connection it is pertinent to quote from the following statement published in 1871 by the Director of the 1870 Census, General Francis A. Walker:

"In such a state of things it would seem to be the duty of those charged with the publication of these statistics to indicate in respect to each class the degree to which the figures may be relied upon, and, as nearly as may be practicable, the proportion of omission or error. It is undoubtedly true that many will by such a course become advised of these deficiencies who never would have discovered them. It is probably true also that many persons will, when candidly advised of the necessary limitations of such statistics, proceed to the conclusion that they are worthless, and thus reject the whole. It is unquestionable, therefore, that the results of the census would obtain more credit if put forth without any admissions or exceptions; but I have not deemed such a course fair to the public. If, in the progress of compilation or correspondence, defects more or less numerous and important have been detected, which it is yet impracticable to remedy, the country has as much right to that information as to the actual figures of the census."

A somewhat different view apparently prevailed in 1908, when an interdepartmental statistical committee addressed a number of questions to the Director of the Census, among which was the following: "What means are used for testing the accuracy of information received for purposes of tabulation? The answer to the question, in part, was as follows:

"All tabulations made in the Census Office are verified; they are not permitted to leave the producing division until their accuracy has been fully tested, and the names of clerks responsible for verification indicated upon the manuscript. All percentages are worked in duplicate, and columns of figures are re-added in proof . . .

"The testing of the work on every report is continuous from stage to stage, both before and after the completion of the original copy. The absence of serious errors in the Census publications is remarkable and gratifying."

The contrast between this attitude and that expressed by General Walker 37 years earlier can scarcely be explained by the gains attributable to the establishment of a permanent Bureau in 1902.

With this background, I should like to present some of our recent findings regarding the 1950 Censuses of Population and Housing. What I will cover is only one part of a very extensive program of evaluating the results of the 1950 Census—the Post-Enumeration Survey (PES). This survey was essentially a re-enumeration, on a probability sample basis, of the population, dwelling units and farms in the United States. The methods employed permitted a case-by-case check on the accuracy of the original enumeration.

I believe that a Post-Enumeration Survey carried out on a basis insuring high quality operation is one of the more powerful devices thus far applied in measuring the quality of the Census. Among the steps taken to insure high quality performance in the Post-Enumeration Survey of the 1950 Census, were selection of the best enumerators and crew leaders, unusually detailed training, the requirement that data be obtained from respondents best qualified for each question, and in general an emphasis upon getting complete coverage even at costs which would be excessive for other than a small sample operation.

The design of the 1950 PES involved making a great many decisions concerning the optimum allocation of resources. I shall not undertake to review these decisions here, since adequate discussion is available in an article by Marks, Mauldin and Nisselson published June 1953 in the *Journal of the American Statistical Association*, and an article by Hansen, Hurwitz and Pritzker to appear in the August 1953 issue of the *American Sociological Review*.

¹ Condensation of a paper presented to the New York Chapter of the American Statistical Association on April 10, 1953.

It will be sufficient for the purpose of the present paper to describe the scope of the Post-Enumeration Survey very briefly. It was based upon a two-part sample, one to measure the completeness of the Census counts and one to measure primarily the quality of the information collected in the Census. The first part consisted of a sample of about 3500 small areas distributed among approximately 300 primary sampling units consisting of counties or groups of counties. A careful canvass was conducted in these areas to locate all households and farms. The listings obtained in this re-canvass were checked against the original canvass to measure the number which had been missed in the Census.

The second part of the sample consisted of a sample of Census listings for 22,000 households and 5500 farms designed to study accuracy of reporting in the Census as well as the extent of erroneous enumeration. The listed households and farms were re-visited by the specially trained PES enumerators, and additional questions were asked concerning a number of subjects which had been previously selected for checking. In order to reduce the burden of travel and of enumeration, the two parts of the sample were located in the same 300 primary sampling units, and there was considerable overlapping between them.

Since the validity of the PES as a test of the reliability of the Censuses is definitely dependent upon the validity of three operating hypotheses, I shall mention them briefly. The first of these is that special provisions for high quality work were successful in producing results of a substantially higher standard than were achieved in the regular census. The second is that the lapse of 4 to 6 months between the Census and the PES did not seriously impair the ability of the PES to measure the completeness of the Census counts and the degree of accuracy of certain Census statistics. The third hypothesis is that the most important elements of census-taking for which measures of performance are required are the collection of the data and the coding and editing of the schedules. It is assumed that the punching and tabulating operations are subject to control by the usual verification procedures and do not require evaluation by the PES technique.

One general consideration to be borne in mind in evaluating all the results of the PES is that the differences between results of the Census and of the Survey do not represent the total error. Despite all the efforts to achieve exceptionally high quality in the sample survey, it is known that some errors were made.

I will now describe some of the findings from the PES under two general headings: (1) The completeness of the Census counts of persons and of dwelling units. (2) The degree of accuracy of certain Census statistics. It should be borne in mind that the figures

on the completeness of the enumeration are final, but that the figures on accuracy of statistics are still preliminary and therefore subject to some revision.

The distinction between the accuracy of counting and the accuracy of statistics is an important one, although it has not always been recognized. As I will point out in some detail later on, errors made in counting constitute but one source of inaccuracy in the statistics on age and income, on the tenure status of dwelling units and the number of rooms, etc.

Completeness of the 1950 Censuses of Population and Housing

Population

For the country as a whole the *net* deficiency in enumeration amounted to an estimated 2,100,000 persons or 1.4 percent of the enumerated population. This deficiency resulted from a failure to count 2.3 percent of the population, offset in part by the erroneous counting of .9 percent. A person enumerated in the wrong enumeration district would affect both of the *gross* error rates just mentioned, since he was erroneously omitted from one district and erroneously included in another. The gross figures would be reduced by almost .3 percent each, if we excluded this type of error which would never affect national totals and usually would not affect State or even county data.

It is interesting to note that the analysis of the PES survey indicated that padding of the returns has been negligible, at least for the country as a whole. Of the .9 percent of the population erroneously included, less than .1 percent could not be identified by the PES interviewers as individuals who could have been enumerated at the time of the Census. Such a result for the country as a whole does not, of course, preclude the possibility that scattered enumerators may have engaged in some padding of the returns.

There are certain differentials in the net omission rate which generally conform with our previous knowledge concerning the difficulties of enumeration. As far as regional differences are concerned, the differences are not great enough to be entirely conclusive in view of the sampling errors and other limitations. There is indication, however, that the errors in the South are somewhat higher than in the rest of the country, particularly the Northeast. The net percentage of missed persons among rural nonfarm people was twice as high as for the entire population. The net omission rate was nearly three times as high among nonwhites as among whites, a relationship consistent with that observed by Daniel Price when he compared draft registration figures with statistics from the 1940 Census. In the case of persons *not* related to the head of the household the net deficiency in the census count was about six times as great as for persons related to the household head.

Persons missed in the Census. It may be of some interest to examine briefly the characteristics of people who were missed in the census. Before describing their characteristics, we will summarize the reasons for their omission as determined by the follow-up survey. The analysis indicates that almost three-fourths of the persons missed were omitted because census enumerators failed to find or list dwelling units. The remainder of the omissions were due to a variety of causes, of which the two most important were temporary absence from home, and omission of nonrelatives, each accounting for about five percent.

An analysis of the characteristics of missed persons reveals differences from the general population that are for the most part in line with *a priori* expectations. With respect to age, however, the differences are small and it is surprising to find that the age groups up to about 40 years are relatively smaller among the missed persons than among the total population. This particular finding is out of line with other evidence concerning difficulties experienced in obtaining a complete enumeration of the persons in certain age classes. Consequently this phase of the results is being studied carefully to see whether the results reflect anything more than the fact that the PES enumerators were subject to the same difficulties as the Census enumerators had been in enumerating certain classes of people.

In this connection results are now available concerning the net undercount of children under five years of age, as determined from statistics of births and deaths and migration. These figures indicate that in the 1950 Census there was apparently an undercount of about 4.7 percent for children under five. The undercount for nonwhites was more than twice as great as for white children. The figures indicate that the deficiency in the 1950 Census was about one-third less than in the 1940 Census.

Except for age, the characteristics of the erroneously omitted individuals are in line with general expectations. Thus, the proportion of nonwhites among omitted persons was double that in the general population. When we come to relationship, we find that heads or wives and children are underrepresented in the missed group, that other relatives are overrepresented by 50 to 100 percent, and that nonrelatives are overrepresented by 200 to 300 percent. Data on the economic status of missed persons are consistent with the other evidence regarding them. When we review their occupational distribution, we find that such persons include a disproportionate number of household workers, service workers, and laborers of various types. These differentials, of course, need to be evaluated in terms of the color variations already discussed. With respect to income, the missed persons tend to be relatively more concentrated in the classes below two thou-

sand dollars per year.

Persons erroneously included in the Census. There were 1,309,000 persons who were erroneously included in the Census according to the PES. As already pointed out, failure to include persons and dwelling units was not the only type of error made in counting. The erroneous listing of persons and dwelling units was another type of error. The number of such erroneous inclusions picked up in the PES sample is too small to permit any detailed analyses. Some account, however, of why persons and dwellings were listed in error may be in order. The major reasons for the erroneous inclusion were: (1) violation of the rules regarding "usual residence," (2) the enumeration of the relative of a household head who was living elsewhere or no longer living at the time of the enumeration, and (3) the enumeration of persons as occupants of a dwelling unit which was found by PES not to be occupied at the time of the enumeration.

Housing

According to the results of the PES, there was a net deficiency of about 1,070,000 dwelling units or 2.5 percent of the total covered by the Census. The net percentage results from a gross omission rate of 3.1 percent less an erroneous inclusion rate of .6 percent. The net deficiency rate was about twice as great for rental units as for owner-occupied units. Among the renter units the deficiency for rural nonfarm units was higher than that for urban or farm units.

Dwelling units missed in the Census. The reasons for the omission of dwelling units in the Census differed markedly between owner-occupied and renter-occupied units. In the case of the former, nearly three-fourths of the omissions occurred because the entire building was missed, but in the case of the rental units, the proportion was only about half as great (38 percent). The reason for this marked differential is presumably the fact that rental units tend to be most frequent in multi-unit structures where the missing of an entire building is much less probable. In about one-third of the cases when an entire building was missed, a possible explanation was its location near the boundary of the enumeration district. However, there appear to have been comparatively few cases in which there was double-counting of units located near district boundaries. In the case of renter units, other important reasons for erroneous omissions were the enumeration of two or more separate dwelling units as a single unit and the missing of a dwelling unit in a multi-unit structure, even though the building was properly included. Errors of the former type would not affect the completeness of the population count. This helps explain the fact that the net miss rate for dwelling units was over 50 percent above that for individuals.

The erroneously omitted dwelling units differed from the total of all dwelling units enumerated in the Census both with respect to tenure and number of rooms. About two-thirds of the omitted units were renter-occupied, whereas the corresponding proportion among all dwelling units was less than one-half. A similar relationship, with some differences in degree, was observed in both urban and rural areas. The units erroneously omitted, whether owner-occupied or renter-occupied, tended to be smaller than those included in the Census, with a difference of one room in median-number of rooms for both tenure groups. Despite the size differentials, however, there appeared to be no consistent differences between erroneously omitted units and all units with respect to average contract rent.

Dwelling units erroneously included. There were an estimated 265,000 dwelling units which were erroneously included in the Census according to the PES. Among renter-occupied units, more than half of the erroneous inclusions in the Census were due to the fact that a single unit was counted as two or more units. It is interesting to note that the check showed that very few non-existent dwelling units were included in the Census. The total of such units amounted to less than .1 percent of the total, or about the same percentage as that already cited for enumeration of apparently non-existent individuals.

The Degree of Accuracy of Certain Census Statistics

Obtaining complete counts has been legally and historically a major objective of a decennial census, but more and more use is made of types of data involving the reporting, the recording, coding, etc., of information regarding the characteristics of the "units" of enumeration. The PES was designed to measure the total error in census statistics and not merely the "coverage error" component.

The method used for obtaining these measurements involved the establishment for each category of a characteristic under study of a *gross deficiency* in the Census and of a *gross overstatement* in the Census. An example of such a category would be the income class \$500 to \$999. The gross deficiency in the Census count of the number of people in the category would be the sum of the number of people belonging in the category who had been missed in the Census, the number of people who had been included in the Census but put in the wrong category, the number of people who had been left out of the distribution because of an error in the reporting of some other attribute (e.g., omission of income for an individual erroneously reported as under 14) and the number of people for whom information concerning the particular characteristic had not been obtained in the Census. The gross

overstatement in the Census in the category would be the sum of the number of persons erroneously included in the Census who were reported in that class, the number of persons who should have been reported in some other class, and the number of persons in the class erroneously included in the distribution (for example, persons included in a particular income category who were found to be under 14 in the PES and therefore to be excluded from the distribution).

The estimates of *gross deficiency* and of *gross overstatement* for a particular category can be subtracted from one another to give an estimate of the *total net difference* in the Census total for the category. For the purpose of assessing the accuracy of Census statistics, the total net difference estimates furnish information in their own right. These estimates can also be used in studying the accuracy of Census distributions. The procedure that was adopted in the PES (but not, of course, in the published results of the entire census) was to add the estimated total net difference for each category to the final census total for that category. This was possible because the PES was a matching study on a case-by-case basis. The technique used permitted the drawing of a much smaller sample than would have been required to obtain equally reliable PES totals for the categories of a distribution.

In dealing with the subject of the accuracy of Census statistics, I shall first consider the accuracy of Census distributions and then an index of the quality of Census statistics—the gross reporting differences.

Comparison of Percentage Distributions

The following discussion of the comparisons between Census and PES distributions reflects the results of applying the above procedure to a series of characteristics of individuals and of dwelling units.

Age. In the case of white persons, the maximum absolute differences between the two percentage distributions based on 5-year groups were .2 percent, but in the case of most of the categories the differences did not exceed .1 percent. The absolute differences were somewhat larger for nonwhites with a maximum of .8 percent and with the majority of cells showing differences of .2 percent or more.

Occupational group. For the total employed population classified by major occupation group the maximum absolute differences based on 5-year groups were .2 percent, but in the case of females, there was a maximum difference of .9 percent, amounting to a relative difference of nearly 5 percent for that class.

Industrial group. The maximum absolute difference between the two distributions for major industry groups for all employed persons was .4 percent. In the case of females, the differences were somewhat larger, the maximum being .7 percent, with a relative difference of between 3 and 4 percent for the class involved.

Educational attainment. The two distributions for the educational attainment of persons under 25 years of age show differences which are of much the same size as shown for major occupation and industry groups. The maximum absolute difference of .5 percent represents a relative difference of about 8 percent.

When we come to the educational attainment of persons 25 years old and over, the differences between the two distributions are considerably larger and show definite evidence of bias in the Census. The most important difference is for the group with no education. The PES percentage of 3.7 is nearly 50 percent greater than the 2.6 percent shown by the Census, clearly reflecting a reluctance to report the lack of any education. The census distribution showed higher percentages than the PES distribution of persons who had just completed elementary school, or high school or four or more years of college.

Labor force participation. Information on labor-force status was not included in the PES, chiefly because of the considerable interval between the dates of the original and the check enumeration. However, a matching of Census and our Current Population Survey schedules indicates evidence of significant bias in the census returns on this subject. These comparisons show that the Census was deficient by more than 5 percent in the case of the total labor force and by more than 20 percent in the case of unemployment. These differences suggest that the measurement of phenomena of this sort is particularly dependent upon careful observance of established interview procedures.

Income. The proportion of persons receiving no income was significantly lower in PES than in the Census (31.7 percent as compared with 35.4 percent, or about 10 percent lower). On the other hand, in every income group up to \$2,000 per year, the PES had relatively more recipients, a situation probably resulting from the reduction of the proportion of no-income recipients through the more intensive PES questioning.

Tenure of dwelling units. The tenure distributions for the PES survey were not substantially different from those for the Census except for rural-farm dwelling units, where the absolute difference amounted to 1.3 percent. The greater difference in this residence classification is presumably due to the fact that in rural-farm areas the definition of farm tenure and of dwelling unit tenure may have become confused.

Number of rooms in dwelling units. In the case of number of rooms, the median figures were the same for both distributions. Most of the differences were relatively moderate, the largest absolute difference of 1.5 percent amounting to a relative error of less than 6 percent.

Gross Reporting Differences

One of the advantages of an item-by-item comparison is that it provides an indication of the total number of individuals or dwelling units for which information obtained by the PES enumerator did not agree with that given to the original enumerator. Obviously, the number of cases counted as in disagreement will vary according to the class interval used, being much larger, e.g., for single years of age than for 5-year groups. This measure for a given characteristic pertains only to units included in both the census and the PES and for which information was obtained on that individual or dwelling unit.

It is interesting to analyze the gross reporting difference to see whether the census returns were evenly distributed above and below the PES returns. For some characteristics, we can speak of "over-reporting" and "under-reporting." (For example, age, income and even occupation when the occupational classes are viewed as an ordered series in terms of status). A significant deviation from an even division between over- and under-reporting may be indicative of a tendency toward bias in the initial reporting. The findings are presented in terms of percentages, number of differences as a percentage of the enumerated population.

Age. When we examine the age data in terms of 5-year classes, we find a 5.7 percent gross difference or a total of some 9,000,000 persons for whom the census placed an individual in a different age class from that shown by the PES. The overstatement and understatement appear to be about evenly divided.

Occupational group. An analysis of data for broad occupation groups shows a gross difference of 13.6 percent. As in the case of age, there appears to be no significant evidence of upward or downward bias in the original return.

Educational attainment of persons 25 years old and over. As might have been expected, the gross reporting difference in this area (37 percent) is noticeably greater than those just described. In this case about 60 percent of the differences in the Census were in the direction of exaggerating the educational level.

Income. In view of the general acceptance of the view that there are some inaccuracies in census reports on income, it is perhaps surprising to find that the gross reporting difference for all persons 14 years old and older was about the same as that reported for educational attainment. For the total population 14 years old and over, about two thirds of the persons who were reported in different income classes in the census and the PES were reported in a higher class in the PES enumeration. However, when the comparison is limited to recipients of income, there appears to be no tendency for the census either to over-report

CONTINUED ON PAGE 21

REPORT OF ASA ADVISORY COMMITTEE ON STATISTICAL POLICY

TO THE BUREAU OF THE BUDGET

Statement of Principles on Budget Bureau Review of Data Collections Sponsored by Federal Agencies

The Advisory Committee on Statistical Policy was established in October 1951 to advise the Office of Statistical Standards of the Bureau of the Budget, and through it the Federal statistical system, on broad matters of public policy in the statistical area. The committee is composed of past presidents of the American Statistical Association who are not at present affiliated with any Federal agency. Previous reports of the Committee have dealt with interagency transfers of statistical schedules (April-May 1953 American Statistician) and direct government collection of statistical data (October 1953 American Statistician).

Data on a broad variety of subjects are currently collected by, and on behalf of, various Federal agencies. The Federal Reports Act of 1942 and the Budget and Accounting Procedures Act of 1950 express the clear intent of Congress that such collections shall be reviewed by the Bureau of the Budget. However, since some of these are carried out on behalf of Federal agencies by private organizations, such as universities and commercial research agencies, problems of review are raised that are different from those customarily involved when data are directly collected by Federal agencies.

The Office of Statistical Standards is clearly responsible for reviewing proposed data collections sponsored by any Federal agency except those exempted by statute. Such collections include the securing of identical information from more than ten respondents. The responsibility—generally to assist in improving the comparability and adequacy of Federal statistics—is not diminished when the data are collected by a second party on behalf of a Federal agency.

The Committee believes, however, that the method of discharging such responsibility must differ as among different types of collection. For the more ordinary types of data collections that use established collection methods, the review procedures developed by the Office of Statistical Standards seem appropriate; and apply both when such data are collected by a Federal agency and when they are secured on behalf of an agency by a private organization.

Review of data collections to be undertaken by private organizations as incident to research sponsored

by a Federal agency, however, is another matter. Studies of the National Science Foundation suggest that sponsored research may be usefully classified as (1) research sought by Federal agencies to assist them in carrying out assigned programs, and (2) research sponsored by Federal agencies as adding to scientific knowledge, and hence a matter of public interest. The former is designated "purchased" research; the latter "supported" research. Since "supported" research should contribute long term gains in knowledge, ample room must be left for it to be pursued by a variety of approaches—including those that, to any particular scholar, may appear to lead only to blind alleys.

Because it is difficult to distinguish in advance those projects which fall into this category we can offer only some broad suggestions for review procedure.

(1) Decision as to which projects should be classified as "purchased" research and which as "supported" research should be made by the contracting agency in consultation with the Office of Statistical Standards and subject to its final decision.

Although the Office of Statistical Standards is responsible for seeing that high standards of statistical practice are followed, it should, nevertheless, allow maximum freedom, consistent with its responsibilities, to investigators who collect data in "supported" research projects.

(2) Where the project under consideration is agreed to be of the "supported" research type, the Office of Statistical Standards should rely primarily and in the first instance on review by a qualified body of professional persons in the field. Such groups should be established in all fields where supported research is carried on. Their task should include full review of the proposed research methodology, the competence of the personnel, the availability of the principal investigator, and other relevant factors.

The National Institute of Health procedure for review by a standing advisory group of qualified scholars, for example, has much to commend it. A member of the OSS staff attends the meetings of this group and thereby participates in the review. The Office of Statistical Standards Memorandum of Agreement

with the National Institute of Health, though still experimental, should be further developed and its applicability to other areas tested. Post-audit of applications and project statements, review of operations, agreements on standards to be followed by contractors, and other arrangements may be necessary to provide for adequate statistical competence.

Such arrangements should be viewed as the basic procedure whereby OSS discharges its responsibility for seeing that high standards of statistical practice are followed in government supported research.

(8) Standards for the collection of data, such as those embodied in Budget Circular A-46, Exhibit A,

should be utilized in planning and conducting all statistical surveys, including those that are part of "supported" research project. The progress of research requires, among other things, the development of codified, consistent and accurate data. Survey standards which facilitate such development should, therefore, be utilized in statistical surveys, except where the survey design is itself intended to test new procedures or new methods of classification.

WILLIAM J. CARSON, *Secretary*

Members of Committee: William G. Cochran, E. Dana Durand, Simon Kuznets, Isador Lubin, William F. Ogburn, Lowell J. Reed, Samuel S. Wilks.

EXTENT AND CHARACTER OF ERRORS—

Continued from Page 19

or under-report. The bias appears to lie in the failure of some persons who had income in 1949 to report any income at all in the 1950 Census.

Tenure of dwelling units and number of rooms. The gross difference in reporting tenure was comparatively low (about 3.0 percent). There was a gross difference of about 18 percent in reporting of the number of rooms, with evidently a slight tendency on the part of the Census to under-report the number of rooms.

Summary

It is difficult to summarize the many different figures which have been cited on the results of the Post-enumeration Survey. On the whole it seems that the results are not such as to be a source of great surprise or disappointment. A net deficiency rate of a little under one and one-half percent for individuals and of about two and one-half percent for dwelling units should not be disturbing to anyone aware of the complications of the census-taking process. The characteristics of the omitted persons are generally in line with expectations, with a notable exception in the case of age differentials. We need to do considerably more work to explain why the proportion of persons under 40 was lower among missed persons than among the general population. This finding is not in line with evidence from earlier censuses of the difficulty of enumerating children under 5 and males from 20 to 34 years of age. With respect to characteristics other than age, we find that the evidence is very consistent

concerning the tendency of persons with lower economic status to be less completely enumerated than the general population.

For most uses of census data, errors are significant only as they lead to modification of the distributions of basic characteristics of the total. In most cases an item-by-item comparison of census and PES distributions shows differences of much less than one percent in absolute terms. Instances of larger deviations are typically those where there is evidence of bias in the original reports, as in the case of persons reporting no income or no education.

Despite the comparatively small differences in percentage distributions, the proportions of cases classified differently by the original enumerators and the PES interviews are quite large. Even in the case of age, more than 5 percent of the population were reported in different age groups by the two sets of enumerators and when we come to subjects like income and educational attainment, there is disagreement for about one-third of the individuals.

I hope the results presented may arouse your interest sufficiently so that you will undertake to give careful study to the results of the various studies of quality which will be completed within the next year or so. We need the help of statisticians in interpreting the results and in deciding upon future policy. We shall be interested in getting advice as to the amount of resources we should allocate to improving the quality of future censuses and to measuring their accuracy.

16th Annual Meeting of the INSTITUTE OF MATHEMATICAL STATISTICS

The Institute of Mathematical Statistics will hold its 16th annual meeting, concurrently with the annual meeting of the American Statistical Association, at the Shoreham Hotel, Washington, D. C., December 27-30, 1953. A number of sessions on each of the IMS and ASA programs will be sponsored jointly by the two societies. The provisional IMS program is given below:

SUNDAY, DECEMBER 27

10:30 A.M. LOGICAL FOUNDATIONS OF PROBABILITY THEORY AND STATISTICAL INFERENCE

Chairman: G. Tintner, Iowa State College
Papers: INDUCTIVE APPROACH by R. Carnap, University of Chicago
SET THEORY APPROACH by M. Loève, University of California, Berkeley
FREQUENCY APPROACH by A. Copeland, University of Michigan
Discussion: F. J. Anscombe, Cambridge University
J. W. Tukey, Princeton University

2:00 P.M. STOCHASTIC PROCESSES—I

Chairman: D. Blackwell, Howard University
Papers: STOCHASTIC LEARNING THEORY by M. M. Flood, Columbia University
INTERPOLATORY STOCHASTIC PROCESSES AND SOME SIMPLE TESTS by D. Darling, University of Michigan
STATISTICAL INFERENCE IN POISSON PROCESSES by A. Birnbaum, Columbia University
RELATIONSHIP OF CERTAIN LEARNING MODELS TO MORE GENERAL STOCHASTIC PROCESSES by T. E. Harris, Rand Corporation

4:00 P.M. STOCHASTIC PROCESSES—II

Chairman: J. Wolfowitz, Cornell University
Papers: ESTIMATION IN CONTINUOUS STOCHASTIC PROCESSES by J. Kiefer, Cornell University
INFORMATION CONTAINED IN A FINITE TIME INTERVAL by H. Rubin, Stanford University
SMALL SAMPLE DISTRIBUTION AND BIAS OF LEAST-SQUARES ESTIMATORS IN A DISCRETE MARKOV PROCESS by J. Gurland, Iowa State College

8:00 P.M. BUSINESS MEETING—1953 COUNCIL

MONDAY, DECEMBER 28

9:00 A.M. CONTRIBUTED PAPERS—I

Chairman: M. Halperin, National Heart Institute
Papers: (TITLES TO BE ANNOUNCED)

9:00 A.M. APPLICATION OF STOCHASTIC METHODS TO STUDIES OF GROWTH (with American Statistical Association and Biometric Society, ENAR)

11:00 A.M. RIETZ LECTURE

Cosponsor: Econometric Society
Chairman: M. A. Girshick, Stanford University
Paper: ON SOME QUESTIONS CONNECTED WITH MATHEMATICAL RISK by H. Cramer, University of Stockholm and University of California, Berkeley

2:00 P.M. STRUCTURAL RELATIONS BETWEEN RANDOM VARIABLES

Cosponsors: Econometric Society
Chairman: T. C. Koopmans, University of Chicago
Papers: THE GENERAL PROBLEM OF LINEAR STRUCTURAL RELATIONS by T. A. Jeeves, University of California, Berkeley
THE PROBLEM OF EFFICIENCY OF ESTIMATES OF STRUCTURAL PARAMETERS by C. Stein, Stanford University
ESTIMATION BY THE MINIMUM DISTANCE METHOD by J. Wolfowitz, Cornell University
Discussion: L. Hultz, University of Minnesota
H. Rubin, Stanford University

4:00 P.M. SURVEY OF NONPARAMETRIC THEORY AND METHODS

Chairman: L. E. Moses, Stanford University
Cosponsors: American Statistical Association
Papers: CHARACTERIZATION OF DISTRIBUTION-FREE STATISTICS by Z. W. Birnbaum, University of Washington
A GENESIS OF RANK TESTS AND SOME CONJECTURES BASED ON IT by E. L. Lehmann, University of California, Berkeley
OPTIMUM NONPARAMETRIC TESTS FOR SMALL SAMPLES by I. R. Savage, National Bureau of Standards
Discussion: M. Dwass, Northwestern University
H. Levene, Columbia University
R. M. Sundrum, University of North Carolina

9:00 P.M. INFORMAL PARTY AND RECEPTION WITH AMERICAN STATISTICAL ASSOCIATION

TUESDAY, DECEMBER 29

9:00 A.M. PRELIMINARY TESTS OF SIGNIFICANCE AND POOL RULES

Cosponsors: American Statistical Association, Biometric Society (ENAR)
Chairman: W. G. Cochran, Johns Hopkins University
Papers: TO POOL OR NOT TO POOL by A. E. Paull, Abitibi Power and Paper Company, Ltd.
SOME APPLICATIONS by T. A. Bancroft, Iowa State College
AN EXTENSION by D. Huntsberger, Iowa State College
Discussion: Robert Bechhofer, Cornell University
G. W. Snedecor, Iowa State College

9:00 A.M. THEORY OF ORGANIZATIONS (with Econometric Society)

11:00 A.M. SPECIAL INVITED ADDRESS

Chairman: C. Eisenhart, National Bureau of Standards
Paper: PROBABALISTIC TREATMENT OF PHENOMENA: STOCHASTIC MODELS AND INTERPOLATORY FORMULAE by J. Neyman, University of California, Berkeley

2:00 P.M. RECENT DEVELOPMENTS IN DECISION THEORY

Chairman: J. Laderman, Office of Naval Research
Papers: OPTIMUM INVARIANT DECISION FUNCTIONS by M. A. Girshick, Stanford University
POINT ESTIMATION AND THE THEORY OF DECISION by L. J. Savage, University of Chicago
AN EXTENSION OF WALD'S THEORY OF STATISTICAL DECISION FUNCTIONS by L. Le Cam, University of California, Berkeley
EXPLICIT CHARACTERIZATIONS OF COMPLETE CLASSES FOR SOME TESTING PROBLEMS by A. Birnbaum, Columbia University

4:00 P.M. CONTRIBUTED PAPERS—II

Chairman: J. Lieblein, National Bureau of Standards
Papers: (TITLES TO BE ANNOUNCED)

6:00 P.M. ANNUAL BUSINESS MEETING—FOR ALL MEMBERS

8:00 P.M. MULTIPLE DECISION PROBLEMS (with American Statistical Association)

WEDNESDAY, DECEMBER 30

8:30 A.M. CONTRIBUTED PAPERS—III

Chairman: M. Gurney, Bureau of Census
Papers: (TITLES TO BE ANNOUNCED)

9:00 A.M. APPLICATION OF SURVIVORSHIP METHODS

(with American Statistical Association, Biometric Society, ENAR, and American Public Health Association)

10:30 A.M. ESTIMATION OF RATES

Cosponsors: American Statistical Association, Biometric Society (ENAR)
Chairman: E. G. Olds, Carnegie Institute of Technology
Papers: ESTIMATION OF THE INTERVAL RATE IN ACTUARIAL CALCULATIONS: A CRITIQUE OF THE PERSON-YEARS CONCEPT by J. Berkson, Mayo Clinic
IMPROVEMENT RATE OF MENTAL PATIENTS by E. Fix, University of California, Berkeley
PROBLEM OF WITHIN-FAMILY ATTACK RATE by W. Gaffey, University of California, Berkeley
CONSISTENCY OF ESTIMATORS UNDER A SPECIALIZED BIOASSAY PROCEDURE by W. F. Taylor, School of Aviation Medicine

2:00 P.M. SURVEY OF THE THEORY OF FINITE SAMPLING

Cosponsors: American Statistical Association
Chairman: F. F. Stephan, Princeton University
Papers: AIMS AND METHODS by W. G. Cochran, Johns Hopkins University
FINITE SAMPLING CONCEPTS IN EXPERIMENTAL STATISTICS by J. Cornfield, National Institutes of Health
DESIGN OF SAMPLE SURVEYS by J. F. Daly, Bureau of the Census
Discussion: H. O. Hartley, University College, London and Iowa State College
R. J. Jensen, Iowa State College
J. W. Tukey, Princeton University

4:00 P.M. BUSINESS MEETING—1954 COUNCIL

BOARD RESOLUTION ON W. EDWARDS DEMING

The Board of Directors of the ASA, at its meeting on October 29, passed the following resolution concerning Dr. W. Edwards Deming's contributions to statistics.

In view of the recent separation of W. Edwards Deming from the service of the United States Government after more than a quarter of a century, the Board of Directors of the American Statistical Association deems it appropriate to recognize the extraordinarily great contributions made by Dr. Deming to the advancement of statistics and the elevation of statistical standards in the government. In particular, the Board notes Dr. Deming's contributions

In the recruitment, training, and development of able statisticians in the government service;
in achieving increased utilization and acceptance of sampling methods in the collection and compilation of statistical data;
in the introduction of statistical quality-control methods into large scale clerical operations; and
in disseminating sound and productive statistical ideas to industry and research throughout this country and abroad.

The Board commends and congratulates Dr. Deming for his signal contributions to statistics in the government and expresses every good wish for his continued activities toward the enhancement of the quality and usefulness of statistics in his new endeavors.

NEWS ABOUT MEMBERS

B Adam Paul Banner is now employed as a chemist in the Main Analytical Laboratory of the Dow Chemical Company, Midland, Michigan.

Robert F. Boldt is an assistant in instruction in the Department of Psychology at Princeton University where he is working on his Ph.D.

David W. Bussell, formerly Assistant Professor of Business Organization at the Ohio State University, is now employed by the Refiners Transport and Terminal Corporation, Detroit, Michigan.

C Alonzo Church, Jr. is a statistician with the National Lead Company of Ohio, an AEC contractor. His work includes quality control, experimental design, etc.

C. C. Cocherham, formerly with the Department of Biostatistics at University of North Carolina, has joined the staff of the Institute of Statistics at North Carolina State College as Associate Professor. He will assist with the program of Quantitative Genetics.

Mary Corcoran is Research Assistant at the Bureau of Institutional Research, University of Minnesota, and is working toward a Ph.D. in educational psychology.

D Claude L. Dahmer, Jr. has recently accepted a position with Daniel Starch and Staff, a private research firm in the New York City vicinity.

Owen Delap has transferred from the Division of Manpower and Employment Statistics of the Bureau of Labor Statistics to the Bureau of Employment Security, U. S. Department of Labor.

Robert G. Demaree formerly Assistant Professor of Psychology at the University of Illinois, is now Projects Officer, Armament Maintenance Division, Armament Systems Training Research Laboratory, Human Resources Research Center, Lowry Air Force Base, Denver, Colorado.

Charles W. Dunnett is now employed by the Lederle Laboratories Division of the American Cyanamid Company, located at Pearl River, New York.

F Milton C. Forster, formerly Chief of the Research Division, Coordination Service, has been designated Acting Director of the Reports and Statistics Service, Office of the Comptroller, Veterans Administration.

Oliver C. Francis has been awarded a fellowship by the Iowa State College, Ames, Iowa, where he is studying for his Master's Degree in Statistics.

Irwin Friend, formerly Chief of the Business Structure Division of the Office of Business Economics, U. S. Department of Commerce, has resigned to accept a position on the faculty of the Wharton School of Business and Finance, University of Pennsylvania.

G Ross Garrett has been appointed Consultant, Health and Hospital Affairs, at Sears Roebuck & Co.

H David B. Hanchett, formerly with Interindustry Staff of the Office of Statistical Standards, U. S. Bureau of the Budget, has joined the staff of Olin Industries, Inc. in New Haven.

Morris Hansen, Assistant Director for Statistical Standards in the Bureau of the Census, is now on a six weeks temporary assignment in the Bureau of Agricultural Economics as an adviser on crop and livestock reporting procedures.

Oscar Harkavy is on leave from Syracuse University as Assistant to the Director, Division of Economic Development and Administration, of the Ford Foundation.

Samuel P. Hayes, Jr., who formerly headed the Far East Programs of the Foreign Operations Administration, has been named the first Director of the Foundation for Research on Human Behavior. This foundation was established recently in Ann Arbor, Michigan, to increase and improve research on current problems of human behavior and to bring about wider understanding and utilization of research methods and findings.

Irwin M. Heine is Chief of the newly-established Statistics and Special Studies Office of the Maritime Administration.

George M. Heller, formerly in the Offices of Assistant Director for Statistical Standards, Census Bureau, has transferred to the Ordnance Engineering Corporation in Rockville, Maryland.

Leon H. Herbach, formerly Instructor in Mathematics, Brooklyn College, is now Research Associate in the Research Division, College of Engineering, New York University. He is a member of a recently formed statistical research and consulting group.

Harold F. Huddleston has recently transferred to the Office of Agricultural Estimates, Bureau of Agricultural Economics at Raleigh, North Carolina, in connection with the Research Unit which is being established to conduct pilot studies and basic research to improve techniques of forecasting crop production.

J Frederica Y. Jefferson has received a Grant fellowship to pursue Ph.D. work in the Department of Child Development at Cornell University.

K Fritz Kafka, formerly with the Office of Statistical Standards, Bureau of Labor Statistics, has joined Chas. Pfizer & Co., in Brooklyn, N. Y., as a statistician.

Wharton F. Keppler has recently transferred from his position as Statistical Quality Control Specialist, Central Air Procurement District, Detroit, Michigan, to the Naval Ordnance Test Station, China Lake, California, where he is Analytical Statistician (General) in the Test Department, Assessment Division, Test Design and Evaluation Branch.

Nothaniel R. Kidder, formerly with the Operations Research Office of the Johns Hopkins University, has been appointed Manager of Market Research and Sales Analysis of the Jones and Lamson Machine Company in Springfield, Vermont.

Huan Pao Kuang has left the Bureau of Economic Research and Statistics, American Dental Association, and is now a senior statistician at the University of Minnesota.

L Robert B. Ladd has resigned from the Office of Statistical Standards of the Bureau of the Budget and joined the staff of the Operations Research Office of Johns Hopkins University.

Clarence D. Long, formerly with the Johns Hopkins University, has joined the staff of the Council of Economic Advisers.

Arthur A. Lumsdaine is now Director of Research, USAF, 6563d R & D Group (Technical Training Research Laboratory). This is one of the laboratories of the USAF Human Resources Research Center of the Air Research and Development Command, and is located at Chanute AF Base, Illinois.

M Dan H. Mater is Assistant Chief of the Statistics and Special Studies Office recently established in the Maritime Administration.

Albert S. Mincis has been employed since October 1952 as a Social Science Analyst at the Bureau of the Census, conducting specialized studies on the social, demographic and economic characteristics of the population of foreign countries in various parts of the world.

N Sidney I. Neuwirth, formerly Biometrician with the Scientific Research Division of Schering Corporation, Bloomfield, New Jersey, is now associated with the American Medical Association in Chicago as Biometrician and Assistant to the Secretary of the Committee on Research. He will consult on the statistical design and analysis of all experimental work done by the Committee.

Frank D. Newbury has moved to Washington to accept an appointment as Assistant Secretary of Defense (Applications Engineering).

O Leo M. Orwicz, formerly Chief of the Analysis and Evaluation Branch of the Actuarial and Financial Services Division of the Bureau of Employment Security, is now Chief of the Benefit Studies Branch, Division of Program Policy and Legislation, in the Unemployment Insurance Service.

P Robert F. Pearse has accepted a position as Senior Associate with Worthington Associates, Incorporated, of Chicago, Illinois.

Frederick Pollak, Associate Actuary of American Life Insurance Company, was transferred from Bermuda to the Home Office of the company at Wilmington, Delaware.

R Albert J. Raebeck, formerly in the Office of Statistical Standards, U. S. Bureau of the Budget, has joined the staff of the Port of New York Authority.

Charles K. Ramond II, who recently received his Ph.D. in experimental psychology from the State University of Iowa, has accepted a position as Research Associate with the Human Resources Research Office, Fort Benning, Georgia, a division of George Washington University which is investigating problems of selecting and training paratroopers.

Carl Robins is now working for the New York University Computing Center as a coder programmer for the UNIVAC (Electronic Digital Computer).

Franz E. Ross, formerly with the Louisville office of Lybrand, Ross Bros. & Montgomery, Certified Public Accountants, has transferred to the Philadelphia office of that firm.

John M. Ryan has accepted a position as economist with the United Gas Corporation in Shreveport, Louisiana. His work will involve a search for optimum rates of exploitation, optimum well spacing, and related problems.

S A. E. Sarhan is now working for his Ph.D. degree at the University of North Carolina.

Lester C. Sartorius, formerly Assistant Professor of Economics in the College of Commerce and Business Administration at the University of Illinois, has joined Deere & Company at Moline, Illinois, as Director of Market Research.

Jack Sawyer received an M.A. in Psychology from Ohio State University in August 1953 and is now working toward a Ph.D. in Industrial Psychology at Purdue University, where he holds a part-time position as Teaching Assistant.

Douglas E. Scates, formerly of Washington, D. C., has joined the faculty of the University of Florida at Gainesville, where he will have charge of courses in statistics, measurements and research, in the College of Education.

Marguerite V. Schneeberger, formerly in the Defense Projects Section, Business Division, Bureau of the Census, has transferred to the Department of the Army.

Erich Arnold Schultz, formerly Chief, Management Analysis Office, Cheli Air Force Depot, California, has returned to his Phoenix, Arizona, home to become Director of the Records and Statistics Division, Arizona State Department of Health.

Irving Senzel is now Assistant to the Chief, Division of Lands, Bureau of Land Management, U. S. Department of the Interior.

Paul B. Simpson, formerly Associate Professor of Economics at the University of Oregon, is now Acting Chief, Business Finance and Capital Markets Section, Division of Research and Statistics, Board of Governors of the Federal Reserve System, Washington, D. C.

Paul N. Somerville, who recently obtained a Ph.D. degree from the University of North Carolina, has accepted a position as Associate Professor at the Virginia Polytechnic Institute. The topic of his thesis was: "Some Problems of Optimum Sampling."

Mary E. Spear, Visual Information Specialist with the Bureau of Labor Statistics, retired from the Government on September 30, after thirty years of service. She will continue work as visual consultant for private industry.

David S. Stoller has accepted a position with the Aircraft Division of the RAND Corporation, Santa Monica, California.

Ralph Thomlinson has begun work as an instructor in the Department of Sociology at the University of Wisconsin, where he is teaching courses in statistics and population.

Leo J. Tick, formerly with the Department of Mathematical Statistics, Columbia University, is now in charge of a statistical research and consulting group at the Research Division, College of Engineering, New York University.

David L. Wallace is a Moore Instructor in Mathematics at the Massachusetts Institute of Technology.

Walter F. Willcox, 93-year-old emeritus professor at Cornell, has been honored by the establishment of a book endowment. The income will be used chiefly for books on economics and statistics, subjects that Professor Willcox taught at Cornell from 1891 until his retirement in 1931. Professor Willcox is a Past President and Fellow of the ASA.

Paul Wischkaemper is Assistant Professor of Business Administration in the Department of Economics and Business Administration at Alabama Polytechnic Institute, Auburn, Alabama.

Loring Wood, who for the past several years has been with the Mutual Security Administration in Paris, has been appointed Director of Statistics for NATO, replacing Glen S. Taylor, who is returning to the U. S.

Elliott B. Woolley, an economist with the Antitrust Division, U. S. Department of Justice, has transferred from Denver, Colorado, where he was on temporary duty, to the Chicago Office of the Antitrust Division.

Eugene C. Zorn, Jr., Director of Research on the permanent headquarters staff of the American Bankers Association, has been advanced to Deputy Manager of the Association. He will continue to serve as Director of Research, Secretary of the Commerce and Marine Commission, Secretary of the Advisory Committee on Special Activities, and Secretary of the Government Borrowing Committee.

The American Statistical Association announces with regret the death of Mr. Forrest Dansom, Vice President of the Dayton Chapter. Mr. Dansom, an employee of the Air Materiel Command at Wright-Patterson Air Force Base, was awarded a citation for meritorious civilian service, posthumously. He was Chief of the Budget Branch.

CHAPTER PRESIDENTS AND SECRETARIES

ALBANY—Murray Dorkin, 40 Glenwood Street, Albany, New York; Abbott Weinstein, 104 Morton Avenue, Albany, New York

AUSTIN—Jack G. Taylor, Investment Office, University of Texas, Austin, Texas; John R. Stockton, 111 Waggoner Hall, University of Texas, Austin, Texas

BOSTON—Sybil P. Bindlow, Liberty Mutual Insurance Co., Res. Dept., 175 Berkeley Street, Boston, Massachusetts; Mary E. Wilcox, Massachusetts Division of Employment Security, 881 Commonwealth Avenue, Boston, Massachusetts

CENTRAL INDIANA—William H. Andrews, 214 East 5th Street, Bloomington, Indiana; Donald L. Cheak, 432 East 19th Street, Indianapolis, Indiana

CENTRAL NEW JERSEY—William J. Baumol, Associate Professor of Economics, Princeton University, Princeton, New Jersey; William B. Schwader, Educational Testing Service, Princeton, New Jersey

CHICAGO—De Ver Sholes, 1 North La-Salle Street, Chicago 2, Illinois; John H. Oberndorf, Statistical Tabulating Company, 53 West Jackson Boulevard, Chicago 4, Illinois

CLEVELAND—Gale R. Ober, Jr., Howard Whipple Green & Assoc., 1001 Huron Road, Cleveland 15, Ohio; Myron F. Vincent, Ohio Bell Telephone Co., 750 Huron Road, Cleveland, Ohio

COLUMBUS—John R. Ervin, Ohio State Univ., Columbus, Ohio; Mikhail V. Condoide, 188 West 10th Avenue, Columbus 1 Ohio

CONNECTICUT—David Pinsky, Director of Labor Statistics, State Dept. of Labor, Hartford, Connecticut; Roger Stark, University of Connecticut, Storrs, Connecticut

CUBA—Ing. Hugo Vivo, Calle 28 No. 270, Apt. B, entre 21 y 23, Vedado, Habana, Republica de Cuba

DAYTON—Paul R. Rider, 422 Harman Boulevard, Dayton 9, Ohio; Hugh B. Lewis, 16 Sweetman Street, Dayton 7, Ohio

DENVER—Paul R. Merry, 2910 South Marion, Englewood, Colorado; Henry C. Mosher, Economic Statistician, The Mountain States Tel. & Tel. Co., P. O. Box 960, Denver 1, Colorado

DETROIT—Dr. Charles A. Metzner, Room 2939, School of Public Health, University of Michigan, Ann Arbor, Michigan; John Sagan, 921 North Fernon Street, Detroit, Michigan

HONOLULU—Richard S. Takasaki, 3247 Melemerle Place, Honolulu 13, Hawaii; Frederick S. W. Loo, 39 Hiahii Street, Honolulu 17, Hawaii

UNIV. OF ILLINOIS—Colin R. Blyth, Assistant Professor of Mathematics, University of Illinois, Urbana, Illinois; Vincent I. West, Dept. of Agric. Economics, University of Illinois, Urbana, Illinois

ITHACA—C. R. Henderson, Department of Husbandry, Cornell University, Ithaca, New York; Philip J. McCarthy, New York School of Industrial & Labor Relations, Cornell Univ., Ithaca, New York

LOS ANGELES—John C. McKee, Douglas Aircraft Company, 1301 Pearl Street, Santa Monica, California; Donald A. Smith, 1953 Redesdale, Los Angeles 14, California

MADISON, WISCONSIN—Phillip G. Fox, 403 Sterling Hall, University of Wisconsin, Madison, Wisconsin

MILWAUKEE—George W. Knick, College of Business Administration, Marquette University, Milwaukee 3, Wisconsin; Dr. Joseph V. Talacko, 135 South 77th Street, Milwaukee 14, Wisconsin

NEW ORLEANS—Sully C. Pecot, Statistical Dept., New Orleans Public Service, Inc., New Orleans, Louisiana; Richard W. Graves, Tulane University, New Orleans, Louisiana

NEW YORK—Meredith B. Givens, New York State Dept. of Labor, 1440 Broadway, New York 18, New York; Henry S. Miller, Queens College, Flushing 67, Long Island, New York

NORTH CAROLINA—C. Horace Hamilton, Box 3428, State College Station, Raleigh, North Carolina; J. C. Sentz, Dept. of Experimental Statistics, North Carolina State College, Raleigh, North Carolina

OKLAHOMA—W. G. Hill, 2704 N. W. 44th Street, Oklahoma City, Oklahoma; Wendell Phillips, Southwestern Bell Telephone Co., Oklahoma City, Oklahoma

PACIFIC NORTHWEST—Grant I. Butterbaugh, 6815 20th Avenue, N. E., Seattle 5, Washington; Clyde Court-nage, Accounting Dept., Frederick & Nelson, 5th at Pine, Seattle, Washington

PHILADELPHIA—Raymond T. Bowman, 531 Denwyn Road, Drexel Hill, Pennsylvania; Haym Jalle, 248 Rocklyn Road, Upper Darby, Pennsylvania

PUERTO RICO—Rafael de J. Cordero, Puerto Rican Economic Association, P. O. Box 2003, University Station, Rio Piedras, Puerto Rico; Luz M. Tortuellas, Puerto Rican Economic Association, P. O. Box 2003, University Station, Rio Piedras, Puerto Rico

SACRAMENTO—Sam Osofsky, State Division of Highways, Sacramento, California; Norman Rudy, Sacramento State College, Sacramento, California

SAN FRANCISCO—Hatty S. Schwartz, Federal Reserve Bank of San Francisco, San Francisco 20, California; William A. Hurst, Federal Reserve Bank of San Francisco, San Francisco 20, California

ST. LOUIS—Roy Wenzlick, c/o Roy Wenzlick & Co., 706 Chestnut Street, St. Louis 1, Missouri; Joan Fredericks, Joan Fredericks Market Research, 1602 Locust Street, St. Louis, Missouri

TULSA—Leslie Brooks, Leslie Brooks & Associates, 815 Daniel Building, Tulsa, Oklahoma; Erwin F. Terry, 1932 North Elwood, Tulsa 6, Oklahoma

WASHINGTON—Frederick V. Waugh, Asst. Chief, Bureau of Agricultural Economics, U. S. Dept. of Agriculture, Washington, D. C.; Margaret Martin, Office of Statistical Standards, Bureau of The Budget, Room 440, Washington 25, D. C.

THE FUTURE ANNUAL MEETINGS OF THE ASSOCIATION WILL BE HELD AS FOLLOWS:

| | Headquarters | Dates |
|---|--|---|
| 1953—Washington, D. C. | Shoreham Hotel | December 27-30, 1953 |
| 1954—Montreal, Canada | Hotel Mt. Royal | September 10-13, 1954 |
| 1954—Regional Meeting, San Francisco | (This will be held in December. Final dates and hotel have not yet been chosen.) | |
| 1955—New York City | Hotel Biltmore | (Late in December. Final times not yet chosen.) |

CHAPTER NOTES

ALBANY

The Chapter held its second annual picnic on Saturday, October 3rd at the Helderberg Ski Club Lodge in Thatcher Park. At the regular meeting on October 7th Max S. Weinstein, Actuary of the New York State Employees Retirement System, spoke on "How to Retire Statistically—and Live," an exposition of the rationale behind the State's retirement allowances.

BOSTON

The fall dinner meeting of the Chapter was held on October 22nd at the Harvard Faculty Club. The speaker was Philip Rulon, Professor of Education at Harvard University. Professor Rulon discussed the application of the Fisher discriminate function to the problem of classifying groups of individuals who have been exposed to several personnel tests and the extension of that function to situations where more than two groups and more than two tests are involved.

CENTRAL NEW JERSEY

A meeting was held on October 29th at which Sidney S. Alexander, at present economic adviser to the Columbia Broadcasting System and formerly Chief of the General Analysis Section of the President's Materials Policy Commission, spoke on "The Contribution of Statistics to the Report of the President's Materials Policy Commission." The speaker at the November 9th meeting was J. A. Keats, Statistician for the Australian Council for Education Research, who is at present on leave spending the academic year in study and research at Princeton University and the Educational Testing Service. His subject was "A Statistical Theory of Objective Test Scores."

CHICAGO

The Chapter opened the 1953-54 season with a dinner meeting September 24th, at which Robert W. Burgess, Director of the Bureau of the Census, spoke on "The Role of the Census." A joint luncheon meeting was held with the Chicago Chapter of the Amer-

ican Marketing Association on October 1st. Dr. Morris Gottlieb, Research Director of Nejelski & Co. and formerly Assistant Professor of Mathematics at the University of Chicago, discussed "New Mathematical Aids for Marketing Problems." At the October 15th luncheon meeting the speaker was Justine F. Barbour, President of Barbour's Investment Service, Inc. Mr. Barbour's subject was "Some Observations as to the 1953 Stock Market." The second dinner meeting of the season, held on October 27, heard an address by Senator Paul Douglas on "Economy in Government."

HAWAII

At the first fall dinner meeting held on October 12th Daniel V. Bergman, manager of Territorial Surveys, spoke on "Problems and Procedures in the Sampling of Consumer Preference." Mr. Bergman discussed the methodology and uses of the Consumer Analysis survey of grocery and drug brand preferences in Honolulu.

LOS ANGELES

The October meeting heard Dr. Melvin Salvendy, Assistant Professor of Production Management and head of the Management Research Sciences Project at U.C.L.A., speak on "Design of a Research Program in the Management Sciences." At the preceding meeting Dr. Cecil Dunn of the Southern Counties Gas Company outlined statistical procedures used for determining rates for public utilities dispensing household gas.

NEW YORK

The Chapter opened its 1953-54 season with a meeting October 8th on the "Business Outlook for 1954," which was attended by about 200 members. Dexter Keezer acted as chairman, Roy Reiersen discussed the fiscal and monetary outlook, Leo Barnes the industrial outlook, Leo Barnes and Richard Everett the construction outlook, Norman Urquhart the agricultural outlook, and

Jules Backman the prospect for production of consumer goods. Discussion from the floor followed. The Puerto Rican population of New York City was discussed at the October 21st meeting. Clarence Senior of the Labor Department of the Commonwealth of Puerto Rico served as chairman. A. J. Jaffe of the Bureau of Applied Social Research of Columbia University spoke on population and labor force characteristics, Louis Weiner of the New York City Health Department discussed vital statistics, and Mrs. Sophia Robison of the New York School of Social Work described social conditions. Discussants were Carl Raushenbush of the N. Y. State Department of Labor, Edward Bernath, Assistant Superintendent of Schools of New New City, and Florence Cuttrell of the Welfare and Health Council of New York City.

WASHINGTON, D. C.

The first fall meeting, held September 28th, was devoted to a discussion of the statistical problems of the so-called under-developed countries. The meeting was chaired by Dr. Calvert L. Dedrick, Coordinator of International Statistics of the Bureau of the Census; and the speakers included J. Richard Grant of the Bureau of Agricultural Economics, who spoke on "Improving Agricultural Statistics in Israel"; Miguel Fadul of the Pan American Union, whose subject was "Statistical Needs for National Income Estimates in Latin America"; and Thomas S. Corcoran of the Census Bureau, who described "Problems of Statistical Organization and Administration in Pakistan." At the October 19th meeting the speaker was Daniel Brill of the Federal Reserve Board, who discussed "Financial Statistics and the Money-flows Accounts." Gerhard Colm acted as chairman, and Vito Natrella of the Securities and Exchange Commission, George Javzi of the Department of Commerce, and Raymond W. Goldsmith of Raymond W. Goldsmith Associates served as commentators.

CONTINUED ON BACK COVER

Detroit Pub. Library,
Periodicals Div.,
5201 Woodward Ave.,
Detroit 2, Mich.

A/S
DN

NEW MILWAUKEE CHAPTER

The Board of Directors is pleased to announce the granting of a Charter to the Association's newest Chapter, located in Milwaukee, Wisconsin. The Chapter President is Mr. George W. Knick, College of Business Administration, Marquette University, Milwaukee, Wisconsin; and the Chapter Secretary is Dr. Joseph V. Talacko, Department of Mathematics, Marquette University. ASA members in the Milwaukee area are cordially invited to contact Dr. Talacko for information regarding meetings and other activities of the Chapter.

ACCEPTANCE SAMPLING

A symposium available NOW \$1.50

ACCEPTANCE SAMPLING BY ATTRIBUTES

*Developments Prior to 1941
Wartime Developments*

Paul Peach
E. G. Olds

ACCEPTANCE SAMPLING BY VARIABLES

*Acceptance Sampling by Variables, with Special Reference to the
Case in which Quality is Measured by Average or Dispersion*

J. H. Curtiss

*Use of Variables in Acceptance Inspection for Per Cent Defective
Chairman's Closure*

W. Allen Wallis
J. W. Tukey

THE AMERICAN STATISTICAL ASSOCIATION

1108 16th Street, N.W., Washington 6, D. C.

newer
of Busi
Joseph V
are con
Chapter